Microwave
New Battle Shapes Up—p. 9

How New Power Plants Cut Costs . . . p. 28

RAILWAY AGE

APRIL 22, 1957 • THE INDUSTRY'S NEWSWEEKLY

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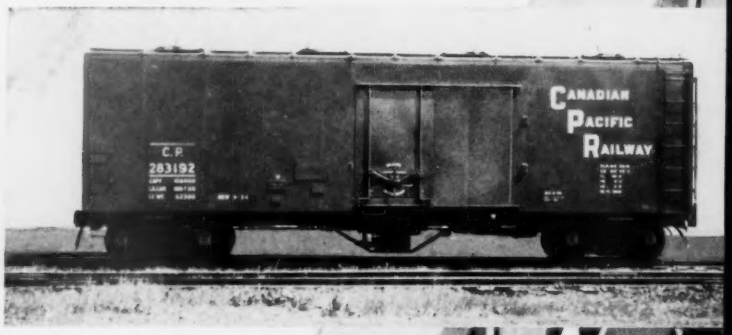

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W. H. MINER, INC. CHICAGO

RAILWAY AGE The Industry's Newsweekly

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April 22, 1957

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PAID CIRCULATION THIS ISSUE ... 14,636

CONTENTS and
Week at a Glance

Current Statistics

Operating revenues, two months	
1957	$1,671,027,680
1956	1,646,576,830
Operating expenses, two months	
1957	$1,331,918,282
1956	1,303,060,291
Taxes, two months	
1957	$171,149,268
1956	169,385,229
Net railway operating income, two months	
1957	$124,000,444
1956	129,924,058
Net income estimated, two months	
1957	$91,000,000
1956	95,000,000
Average price 20 railroad stocks	
April 15, 1957	90.85
April 17, 1956	106.61
Carloadings revenue freight	
Fourteen weeks, 1957	9,271,567
Fourteen weeks, 1956	9,665,581
Average daily freight car surplus	
Wk. ended Apr. 6, 1957	7,603
Wk. ended Apr. 7, 1956	3,580
Average daily freight car shortage	
Wk. ended Apr. 6, 1957	1,297
Wk. ended Apr. 7, 1956	5,087
Freight cars on order	
March 1, 1957	111,965
March 1, 1956	141,437
Freight cars delivered	
Two months, 1957	15,477
Two months, 1956	9,080
Average number railroad employees	
Mid-February 1957	988,664
Mid-February 1956	1,041,458

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Week at a Glance CONTINUED

The Frisco has used 35-mm colored slides, accompanied by companion tape recordings, to instruct 6,000 scattered transportation employees about new rules. Frisco spokesmen believe they've pioneered in this combination of audio-visual aids for system-wide meetings on rule changes.

A new approach to the study of railroad traffic opportunities is needed today. Railroads cannot make the changes in service and charges most to their advantage unless they have comprehensive and systematic information on total traffic in each important commodity.

SHORT AND SIGNIFICANT

Proxy fight . . .

looms on the Missouri Pacific. Four of five directors up for election this year apparently will face opposition from a group which includes T. C. Davis, a present member not renominated by management, and J. M. Balliet, a director of the Pittsburgh & Lake Erie.

Feasibility of a pipeline . . .

between Williston Basin oilfield and St. Paul-Minneapolis and Duluth-Superior areas is being studied by the Great Northern. Pipe Line Technologists, Inc., of Texas is doing the preliminary engineering appraisal.

Permission to quit . . .

passenger service on April 28 was granted to the Chicago, Aurora & Elgin. The deficit-harassed traction line has been carrying 11,000 commuters from west-of-Chicago suburbs daily. Freight service will continue.

New train on the New Haven . . .

is called the "Sunrise." Using Budd-built "Roger Williams" equipment, it is to leave Boston at 6:45 a.m., DST, beginning April 29, arriving New York at 10:45 a.m. Four-hour return to Boston will be as the "Advance Merchant" leaving New York at 4:45 p.m. This dual-naming follows the pattern of the New Haven's other new trains—the "John Quincy Adams" and "Dan'l Webster," which make some runs as the "Mayflower" and the "Bostonian."

RAILWAY AGE
The Industry's Newsweekly

FCC HEARINGS TO BEGIN AS . . .

Microwave Battle Shapes Up

Next month's hearings before the Federal Communications Commission may determine how rapidly railroads can take advantage of microwave's huge capacity for data and communications transmission.

Battle lines are being drawn, with telephone and telegraph companies on one side and railroads, pipelines, electric utilities and other private users in opposition.

American railroads now have five "weatherproof" microwave systems providing telephone, telegraph and printing telegraph communications. Outcome of the hearings (Docket 11866), will probably determine whether railroads will install more of these "beamed radio" communications systems.

The coming battle over microwave, simply stated, will answer this question: Who shall be licensed to operate microwave communications systems in the frequency spectrum above 890 mc? The hearings will give all interested parties a chance to state their cases before the commission about present and anticipated use of microwave. Over 200 notices of appearance have been filed with the commission.

Microwave is "beamed" radio, distinguished from standard radio in which waves are broadcast in all directions. For microwave transmission, the radio waves are "beamed" from one transmitting antenna toward the next about 30 miles on a line-of sight path. By means of repeater stations, microwave communication is relayed over long distances.

Microwave communication can be in the form of voice, telephone, telegraph, printing telegraph, facsimile or television relay service. It is used for remote control and observation of industrial operations and systems. Many messages or functions can be handled simultaneously over a single microwave channel. Because of its high position in the spectrum, 890 megacycles and up, microwave is not affected by weather the same way as is standard broadcast radio. Also, microwave's straight line-of-sight transmission permits the same channel to be used by parallel systems transmitting different kinds of information.

Common carrier microwave systems generally consist of the telephone systems, including the Bell System coast-to-coast network which relays television programs as well as telephone conversations. Western Union Telegraph Company has a common carrier system linking eastern U.S. cities, and is expected to extend it to Chicago.

Private microwave systems are point-to-point systems used by companies for remote control and observation of scattered locations, such as pumping stations along oil and gas pipelines, substations of electric utilities, and for communications across water, like the Santa Fe's microwave system across Galveston Bay. The railroads' microwave systems provide telephone, printing telegraph and CTC control circuits.

Railroads will be represented at the hearings by the Association of Ameri-

THE MICROWAVE BATTLE: PRIVATE VS. COMMON CARRIER

Here's what will be testified at the FCC's microwave hearing:

The **Association of American Railroads** will describe the experience and future needs of the railroad industry. The association maintains that a system of priorities should be established. If limitations on private microwave use are warranted, standards of eligibility should take into account (a) the extent to which a given industry now uses privately owned and operated wire line communications; (b) the extent to which such industry expects to use such communications in the future; and (c) the public service rendered by the industry. Sharing, the association contends, should be permissible on a non-profit basis, but not compulsory. Economic factors involved should furnish all controls necessary. The commission should not consider the availability of common carrier facilities (telephone and telegraph companies) as a condition of eligibility. Use of private microwave systems by railroads would not in any way affect the ability of the communications common carriers to serve the public. Full development of private point-to-point systems on the railroads will depend materially upon interconnection with common carrier facilities. There should be no sharing of the same band of frequencies between common carrier communications and private users.

The **Santa Fe** will present evidence on the present use of frequencies above 890 mc and presently foreseeable future uses for point-to-point radio communications systems. The road also will show how communication demands represented by such uses were previously satisfied. And further, it will indicate the benefits to the railroad industry and the general public from the use of microwave point-to-point relay systems.

American Telephone & Telegraph will show its past, present and anticipated use of radio above 890 mc. Further, it will show the necessity for conservation of frequencies in the establishment of point-to-point systems. AT&T evidence will cover: (1) congestion, particularly in terminal areas; (2) efficiency of common carrier methods of operation in utilization of frequencies; and (3) the need for continued limitations on private systems. Furthermore, AT&T will demonstrate the economic effect of the unrestricted licensing of private systems on users of common carrier services. The impracticability of common carriers sharing frequencies with others also will be shown.

Western Union Telegraph will forecast the probable saturation of all common carrier bands suitable to long-haul systems in the next few years. They contemplate a country-wide network of microwave facilities linking all important cities. Frequency bands already assigned to the communications common carriers, WU will maintain, will prove insufficient within a few years. They will oppose any change in frequencies now allocated the common carriers, and will take the position that frequencies below 10,000 mc should be assigned primarily for intercity or truck operations. Western Union takes the position that private point-to-point microwave use should be authorized only if common carriers cannot provide service. And in those instances where common carriers cannot provide service, definite limitations should be imposed on the duration and type of use for private microwave communications.

Barriger Sees Bigger Role for Electrification

More and more electrification is in store for U.S. railroads during the two decades ahead. This prediction was made by John W. Barriger, president of the Pittsburgh & Lake Erie, in an address to a recent Erie, Pa., meeting of the American Society of Mechanical Engineers. Among those attending the meeting were (above, left to right): W. C. Sommers, retired Pennsylvania freight traffic manager, Pittsburgh; Mr. Barriger; J. C. O'Hara, locomotive and car equipment department, General Electric; and D. R. Meier, acting manager of engineering for the department.

can Railroads and four roads will appear in their own behalfs: the Santa Fe, the Rock Island, the Southern and the Southern Pacific.

An expected charge of "monopoly" is sure to set off fireworks at the hearings. The charge would stem from one of the questions before the commission: Is there any obligation on the part of the commission to protect the general public from any adverse economic effects that telephone and telegraph companies might suffer from the operation of private microwave systems?

One large association of private users says the commission has no obligation to protect telephone and telegraph companies from such a possibility. Furthermore, such protection, in that association's opinion, would tend to create a monopoly for which no need exists, and such a monopoly, it is claimed, in many instances would result in excessive cost to the user. Many private users agree with this thought.

On the other side of the fence are the telephone and telegraph companies. They contend there is a need for conservation of frequencies, particularly in terminal areas where congestion may result if everyone tries "to grab" a piece of the air. They will present evidence of their efficient utilization of frequencies and will contend that there is a need for continued limitations on private systems.

Some telephone companies intend to show why a policy prohibiting private systems, when telephone and telegraph companies can provide point-to-point microwave service, would be consistent with the public interest.

Sharing of frequencies will also come in for much discussion. It is believed in some quarters that the commission should permit users to share frequencies, but should not make it mandatory. Others are firmly opposed to shared frequencies. One telephone company intends to show the impracticability of common carriers (telephone and telegraph companies) sharing frequencies with others.

Interconnection is another bone of contention. For many years, railroads have used the telephones in their offices to make calls, over railroad-owned line wires, to remote on-line offices. Railroads will ask for the same use of phones if they replace these line wire circuits with microwave. So far there is no comment from the telephone and telegraph companies on this point of interconnection, but it is believed they feel that the FCC should not require interconnection.

Eligibility is one of the big issues at stake. One side contends that public interest is of prime consideration, and therefore, the telephone and telegraph companies are best suited to serve that interest. The other side contends that for particular needs the private systems are best, and that by using these systems they lower their costs, which in turn results in lower prices for their products or services. One spokesman for the private users has said that if the telephone and telegraph companies had some competition in this microwave field they would be induced to lower their rates.

A factor hinging on eligibility is that of availability of telephone and telegraph companies' microwave service. Such companies contend that private systems should be licensed only if they cannot or will not provide the service. Private users contend that this availability of telephone and telegraph companies' microwave service should not be a factor. One private user says that these common carrier communications companies' microwave service is available, but at a price he cannot afford. Furthermore, he contends that his use is for a vital public service which cannot be subject to strikes, or other failures beyond his control.

To sum it up, telephone and telegraph companies generally contend that the amount of spectrum available for microwave is limited, and that they can make most efficient use of what there is. Also, they say private users should be allowed point-to-point systems only when telephone and telegraph companies cannot provide the service.

Although what the FCC will rule can only be pure speculation at the moment, some informed sources believe it will issue a series of decisions taking up various parts of the spectrum and various types of services. One general thought is that those who have private microwave systems will be allowed to keep them, even if there is tighter regulation of private users.

Sudden Strike Hits DW&P; All Traffic Halted

A sudden strike—with employees walking off the job after 45 minutes' notice—stopped all traffic last Tuesday on the Duluth, Winnipeg & Pacific, a Canadian National subsidiary.

Members of the Brotherhood of Locomotive Firemen & Enginemen walked out in a dispute over new working rules. CNR spokesmen said the rules were "reasonable and similar to those of other roads operating in the area."

There had been dispute over the rules for more than a month, but the CNR said it had received no threat of a walkout until strike notice was given at 9:15 a.m., April 16. The striking employees, including citizens of both Canada and the U. S., walked off at 10 a.m.

Railroads Support Higher Postal Rates

Post Office Department should pay its own way and not rely on taxpayers, AAR officer testifies; railroads subsidize the government by hauling mail for less than they spend to provide the service, he says

Railroads support the Post Office Department's proposed legislation to increase postal rates.

This support is based upon the railroads' feeling that the Post Office should pay its own way instead of relying on taxpayers, Herbert B. Brand, director, Railway Mail Transportation Division, Association of American Railroads, recently testified before the House Post Office and Civil Service Committee in Washington, D.C.

"Since World War II inflationary pressures in our economy have greatly increased the cost of operating virtually every business which provides services for the people," he said. "Increased wage, material and equipment costs have sharply and repeatedly increased the operating expenses of both the department and the railroads."

Another common characteristic that the Post Office Department and the railroads share alike, he added, is that rates and charges of both are subject to control or regulation by others.

Although the proposed increases will raise railroad postage costs by more than 30%, he emphasized that the railroads believe it only right, however, that they pay their fair share of the department's increased cost of providing mail service to them.

"The railroads also pay large amounts of income taxes to the federal government, now estimated at more than $1 million per day," Mr. Brand asserted. "We believe that we, as well as other general taxpayers, should not be taxed to meet the tremendous losses incurred for the benefit of postal users."

Earlier, Mr. Brand testified that references to transportation by rail in the report of the Citizens' Advisory Council on the Post Office were simply assertions with "supporting facts notably missing." In four instances, he said, "the report is incorrect and the conclusions reached are totally false."

The assertion in the report that $85 million could be saved annually if the Post Office could use the "most economical means of transportation," Mr. Brand said, is based on an estimate made by former Assistant Postmaster General John M. Redding for the Independent Advisory Committee to the Trucking Industry, chairman of which is Dave Beck, head of the International Brotherhood of Teamsters.

"Mr. Redding's conclusion that a 'full truck-mail program' could save any such amount is completely unrealistic, as both the Post Office and the railroads have previously pointed out," Mr. Brand emphasized.

In the first place, he continued, rail and truck services are not comparable, because railroads perform a complete service, including many incidental and costly features.

"Over $1 billion of the railroad investment in stations, roadway and equipment is allocable to mail transportation services," Mr. Brand maintained. "Every day an average of 750,000 miles of passenger-train service is available for department use. Nearly 50,000 railroad employees handle mail at railroad stations. The department is permitted to call upon a fleet of 11,500 storage cars suitably equipped for transporting mail, and over 2,000 specially designed railway post office cars."

He pointed out, on the other hand, that truck charges primarily reflect only transportation expense, and the other services performed by railroads would have to be conducted by personnel in the Post Office Department.

"The facts," Mr. Brand pointed out, "are (1) that the Post Office has complete freedom to use either truck or rail service; (2) the assumed diversions to highways could not physically be made without ruining the mail service or rebuilding thousands of post offices at capital expense of hundreds of millions of dollars, and (3) assuming that these great volumes of mail could actually be put on the highways, the result would be a

AAR Publicizes Railroad Past, Present and Future

The New York Stock Exchange recently opened new facilities for welcoming visitors. The exhibit hall and visitor's gallery present a dramatic and colorful story of the growth of American business through investment. In the central unit of the exhibit (above), of the Association of American Railroads, a scale model train of the 1860's rolls across the foreground of a diorama depicting a pioneer settlement. The three-dimensional scene gives way to one showing a present-day streamliner running through a modern city. This, in turn, changes to show a train of the future going through the city of the future. The three scenes, one after another, are viewed on the same stage. To the right a series of panels show the nature and volume of services performed by railroads in a single day—freight hauled, passengers carried, mail moved, wages and taxes paid.

Hostesses Assigned to Third NYC Train

Waving from a balcony in New York's Grand Central Terminal are the New York Central's newest hostesses, who began their duties April 15 aboard the "Empire State Express" between New York and Buffalo. The young women—one of whom will be aboard each train—will assist mothers with children, dispense travel information and point out scenic places of interest. Last year the NYC introduced secretary-hostesses on its Chicago-New York "Twentieth Century Limited" and its "Ohio Xplorer."

higher, rather than lower, overall operating cost to the Post Office."

Other statements in the report that the executive branch has failed to enforce an existing law, with the result that the Post Office pays railroads a subsidy of $100 million a year, are completely erroneous, the railroad witness said.

"The facts are that instead of being overpaid, railroads are actually subsidizing the government by hauling mail for far less money than they spend to provide the mail service."

Mr. Brand vigorously denied the statement in the report that because of Congressional restrictions the Post Office is wasting millions of dollars annually by using railroads instead of trucks to transport empty equipment such as mail bags.

"The facts are that Congress has imposed no such restrictions," he testified, "and the Post Office uses rail service to move empty equipment only where it is economical."

RRs Seen at Brink of 'Confiscation'

State regulatory policies, developed in a less-than-vacuum-like political atmosphere, are forcing railroads into a frying-pan-to-the-fire situation, Lackawanna President Perry M. Shoemaker contends.

This perilous perch is pictured with the railroads tiptoeing between state confiscation on one hand, and "dependence upon the dole" in the form of public subsidy on the other. It was depicted by Mr. Shoemaker in an address before a civic group at Short Hills, N. J.

He chose that forum to single out for severe criticism recent legislation passed by New Jersey lawmakers. Mr. Shoemaker questioned "the eventual constitutionality, let alone the propriety" of two bills which restrict railroad attempts to eliminate profitless passenger operations. He also assailed the Jersey Board of Public Utility Commissioners for its apparent unwillingness "to consider reasonable evidence with respect to train service adjustments."

Mr. Shoemaker said "there is but one word to describe the inevitable and inflexible economic result [of such policies]—confiscation. Each year the picture becomes more serious with respect to our providing a continuity of dependable rail transportation for those needing it."

He told of futile attempts to abandon the Lackawanna's Boonton Branch serving New York commuters, noting the expense necessary to rehabilitate the branch's equipment. Mr. Shoemaker went on to say the road hasn't been able "to set one dollar aside" to rebuild its suburban fleet, although deterioration of present equipment will eventually force curtailment or suspension of the service.

Since, he said, "financial credit for suburban passenger equipment, on the basis of suburban net income, is just not available today," the only answer may be "public assistance in some form."

Rather than "take the subsidy step and embark on the start of transportation socialism," Mr. Shoemaker recommended that the state of New Jersey be courageous enough to: Give railroads "control over the pattern of fares" such as the Long Island enjoys in New York State; allow railroads to modify service patterns according to real public need; and reexamine, with state municipalities, "the railroad tax picture."

In a speech to the Atlantic States Shippers Advisory Board at Syracuse April 11, Mr. Shoemaker was more optimistic about the Lackawanna's freight operations, noting that, despite tremendous obstacles, "our business outlook for the next 10 years is good." He said that national regulation trends are "encouraging."

ICC Proposes Nine Accounting Changes

The Interstate Commerce Commission has served notice of its intention to modify the Uniform System of Accounts for Railroad Companies in nine respects. Most of the proposed changes are in line with recommendations made recently by a committee of the American Institute of Accountants.

There is no proposal among them to require depreciation accounting for track items, or to modify the accounting for facilities acquired with benefit of fast-amortization arrangements. Suggestions that something should be done about those matters have been made recently to a Congressional committee.

The commission's notice included a proposed order, which will make the proposed changes effective July 1, unless it is modified. Interested parties have until May 31 to file their views with the commission's secretary. Such presentations may include requests for oral argument.

The notice summarized the proposed modifications as follows:

1. Provide for inclusion in net income of all gains and losses, except special and extraordinary items which are not identifiable with usual or typical business operations of the period.

2. Remove the present requirement that appropriations in the category of disposition of net income shall be shown on the income statement.

(Continued on page 14)

MARKET OUTLOOK THIS WEEK

Freight Car Loadings

Loadings of revenue freight for the week ended April 13 were not available as this issue of Railway Age went to press.

Loadings of revenue freight for the week ended April 6, totaled 644,092 cars; the summary, compiled by the Car Service Division, Association of American Railroads, follows:

REVENUE FREIGHT CAR LOADINGS

For the week ended Saturday, April 6

District	1957	1956	1955
Eastern	109,326	118,507	118,004
Allegheny	129,367	140,588	133,802
Pocahontas	54,824	53,855	56,448
Southern	118,565	126,513	108,480
Northwestern	73,545	74,027	73,235
Central Western	109,040	115,274	113,479
Southwestern	49,425	56,614	55,769
Total Western Districts	232,010	245,915	242,483
Total All Roads	644,092	685,378	659,217
Commodities:			
Grain and grain products	48,250	45,946	40,334
Livestock	5,568	7,217	7,024
Coal	115,452	118,467	109,376
Coke	12,378	12,755	11,225
Forest Products	38,071	43,166	40,765
Ore	23,244	25,546	19,613
Merchandise l.c.l.	57,386	61,783	61,753
Miscellaneous	343,743	370,498	369,127
April 6	644,092	685,378	659,217
March 30	694,922	724,968	654,761
March 23	685,833	697,248	634,628
March 16	689,226	685,983	650,924
March 9	672,386	697,601	662,283
Cumulative total, 14 weeks	9,271,567	9,665,581	8,975,927

IN CANADA. — Carloadings for the ten-day period ended March 31 totaled 92,411 cars, compared with 74,461 cars for the previous seven-day period, according to the Dominion Bureau of Statistics.

	Revenue Cars Loaded	Total Cars Rec'd from Connections
Totals for Canada:		
March 31, 1957	92,411	48,710
March 31, 1956	98,522	49,574
Cumulative Totals:		
March 31, 1957	909,136	425,308
March 31, 1956	964,811	450,122

New Equipment

FREIGHT-TRAIN CARS

► *March Deliveries Up, Orders Down.*—New freight cars delivered in March totaled 9,772, compared with 8,184 in February and 5,949 in March 1956, AAR and ARCI report; new freight cars ordered last month totaled 5,359, compared with 6,065 in February and 1,618 in March 1956; backlog of cars on order April 1 was 107,708, compared with 111,965 on March 1 and 137,070 on April 1, 1956.

	Month of March		As of April 1
	Ordered	Delivered	Undelivered
Box—Plain	1,000	3,124	31,599
Box—Auto	—	313	635
Flat	—	123	3,323
Gondola	800	636	11,683
Hopper	3,000	3,627	38,584
Cov. Hopper	400	537	8,394
Refr.	—	540	3,800
Stock	—	—	—
Tank	135	569	7,569
Caboose	—	8	144
Other	24	295	1,977
TOTAL	5,359	9,772	107,708
Car Builders	817	5,611	47,055
Company Shops	4,542	4,161	60,653

► *Baltimore & Ohio.*—Ordered 2,000 70-ton hopper cars, Bethlehem Steel, for delivery in fourth quarter of 1957 and early 1958; B&O's request for bids to build this equipment was reported in Railway Age, April 1.

► *Seaboard Air Line.*—Will build 10 specially designed steel box cars with 20-ft. doors for handling packaged lumber; delivery expected before year end; assembly at SAL's Portsmouth, Va., shop.

LOCOMOTIVES

► *Anglo-Lautaro Nitrate Corp. (Chile).*—Ordered 11 changeable-gage diesel-electric locomotives from General Electric at cost of $1.25 million; delivery scheduled for early 1958.

► *Cuban Dominican Sales Corp.*—Ordered 12 standard-gage 660-hp diesel units, General Electric, at cost of $1,000,000; units, to replace steam locomotives, will haul sugar cane between four plantations and a processing plant.

New Facilities

► *Atlantic Coast Line.*—Will install centralized traffic control on 33 miles of single track between Waycross, Ga., and Folkston; control will be from machine at Waycross which also controls CTC between Jesup, Ga., and Walthourville, 19 miles, and Waycross to Jesup, 39 miles; order for engineering and equipment was placed with Union Switch & Signal division of WAB Co.

► *Baltimore & Ohio.*—Awarded contract for substructure and *(Continued on next page)*

MARKET OUTLOOK (continued)

foundations of new $4,000,000 fruit pier to be on south side of Locust Point in Baltimore harbor; bids for the superstructure may be accepted shortly; target date for completion of the pier is July 1958.

► *New York Central.*—Will construct new retarder classification yard at Suspension Bridge, N.Y., near Niagara Falls.

► *Pennsylvania.*—Ordered electronic parcel post and mail bag sorting system from Stewart-Warner Electronics; system, to be installed in large terminal, will enable one man to do work of nine manual sorters; on order from same firm is television film recorder which will photograph freight cars entering a yard, providing a permanent record for car checking; another electronic device on order is an empty hopper car sorter, which picks up color codes on sides of cars, automatically controlling switches to route cars to proper tracks in a yard.

► *Rock Island.*—Will install "transistorized" audio frequency overlay track circuits for highway crossing protection equipment controls at Bureau, Ill.; equipment, said to be first such installation at a highway crossing, superimposes a control circuit upon existing track signal circuits without interference and without need for insulated joints; equipment was ordered from Union Switch & Signal division of WAB Co.

► *Western Pacific.*—Completed new track connecting its line with Oakland Terminal Railway at cost of $500,000; track provides direct connection between WP and Port of Oakland, Oakland Army Base and industries served by the OT; franchise granted by city allows operation of trains only at night.

Purchases & Inventories

► *January Purchases Up $28,252,000.*—Purchases by domestic railroads of all types of materials in the first month of 1957 were $28,252,000 higher than in January 1956; inventories on January 1, 1957, were $68,237,000 higher than on January 1, 1956; estimates in the following tables were prepared by Railway Age research department.

PURCHASES*	*January 1957*	*January 1956*
	(000)	*(000)*
Equipment**	$ 52,302	$ 27,455
Rail	8,917	9,456
Crossties	6,643	5,886
Other Material	99,043	106,893
Total from Manufacturers	$166,905	$149,690
Fuel	39,722	38,685
Grand Total	$206,627	$188,375

* Subject to revision.
** Estimated value of orders.

INVENTORIES*†	*January 1, 1957*	*January 1, 1956*
	(000)	*(000)*
Rail	$ 44,291	$ 44,730
Crossties	91,945	88,013
Other Material	544,625	482,485
Scrap	23,018	21,793
Fuel	30,536	29,157
Total	$734,415	$666,178

*Subject to revision.
†All total inventory figures taken from ICC statement M-125 for month indicated.

(Continued from page 12)

3. Apportion federal income taxes according to sources or classes of income.
4. Provide rules for ultimate disposition of "Acquisition Adjustment" which resulted principally from adjustment of capitalization and property valuation in reorganization and mergers.
5. Provide a current liability account for maturing debt obligations which are to be paid within one year.
6. Reduce the cash balances reported in financial statements by the amount of bank checks and drafts released to payees.
7. Provide that definite liabilities for unpaid claims in process of settlement covering injuries to persons, loss and damage, and other casualties and similar items shall be transferred at the close of the year from reserves to current liability account.
8. Provide that amounts charged to the accounts prescribed for operating expenses and other accounts for conducting transportation operations shall be just and reasonable, and that any payment in excess of just and reasonable charges shall not be included in such accounts.
9. Provide a special balance sheet account to show liability for federal income taxes, apart from other taxes.

Senate Committee Approves Safety Bills

Three bills to implement recommendations of the Interstate Commerce Commission have been reported favorably to the Senate by its Committee on Interstate and Foreign Commerce. They are:

S.1463, to include motor carriers in the Medals of Honor Act.

S.1491, to rewrite the Transportation of Explosives Act.

S.1492, to increase the fines for safety-act violations to the point where they reflect the decreased value of the dollar.

Air Lines' Defense Travel Revenues Top Rails' Share

The Department of Defense paid commercial air lines about $17½ million more than it paid railroads and the Pullman Company for passenger service during 1956.

Figures made available by the department show that $103,773,434 was spent for travel last year, and that $57,704,268 of it was paid to air lines. Railroads got $34,349,319 and the Pullman Company got $5,860,187, a total of $40,209,506. Bus lines got $5,859,660.

Traffic data showed that the railroads performed more passenger-miles for the department than did the air lines—1,362,911,591, compared with 1,141,725,587. The rails also

carried more passengers—1,610,882, compared with 1,060,315. On the latter score, however, the bus lines were tops, having carried 1,863,874 passengers; but they performed only 260,304,191 passenger-miles.

Average fare paid to the railroads was 2.52 cents per passenger-mile, while an average of another 1.03 cents per passenger-mile was paid for nearly half of the rail travelers who used Pullman service. Average fare paid to air lines was 5.05 cents per passenger-mile, and bus lines got an average of 2.25 cents. Average journeys of rail, air and bus travelers, respectively, were 846 miles, 1,077 miles and 140 miles.

NEW SAFETY STUDIES URGED BY CLARKE FOR RR DOCTORS

New efforts in unexplored areas must be undertaken to improve the railroad safety picture, according to ICC Chairman Owen Clarke.

He urged the AAR's Medical and Surgical Section at its annual meeting to investigate the reasons for human failures that sometimes cause train accidents.

"Too little is known" Mr. Clarke said, about these things: hypnotic influences on a train engineer; drowsiness in smooth-riding, droning diesel cabs; ideal temperatures for diesel cabs; and how much fresh air an engineer needs to remain alert and awake.

Mr. Clarke also asked the medical officers to assume greater responsibility in such things as setting standards for the return to work of injured employees, and in developing programs of periodic physical examinations.

Mr. Clarke also noted something of a leveling off in the railroad fatality rate. This was 5.77 persons killed per million train miles in the five years prior to World War II, was cut to 3.95 in the 1946-1950 period, but has stayed "between" 3.24 and 3.89 since 1950, he said.

Bulk Commodities Lose Exemption in Mixed Tow

Commodities in bulk lose their exemption from regulation under the Interstate Commerce Act's water-carrier provisions if they are transported in a tow which includes a barge of non-bulk commodities.

The Interstate Commerce Commission's Division 4 has made that determination in response to questions asked by Commercial Transport Corporation in a case docketed as No. 32033.

Five Flat Cars Haul T&P's 'Largest Job'

The 110-ton steel fractionating tower above required five Texas & Pacific flat cars for the haul to Big Spring, Tex. Erected there this month for the Cosden Petroleum Company, it stands over 20 stories high and forms, together with three sister towers, the tallest structure in West Texas, according to the oil company. The T&P called the delivery its "largest job."

The commission also found that incidental towage performed for other water carriers subject to the act is exempt from regulation even though a barge of non-bulk commodities be towed in the same unit with bulk commodities. It said the latter finding would be the same irrespective of whether there is a relationship, corporate or otherwise, between the tower and carriers for which the incidental towage is performed.

Car Purchase Plan Goes to AAR Board

A proposed plan for the acquisition and financing of new railroad rolling stock—a plan reportedly advocating a "third party" agency to buy cars and rent them to roads on a per diem basis—was presented at a special meeting of the AAR board of directors on April 12.

No action was taken on the plan, but a brief statement issued by the AAR following the meeting said the matter "will be further considered by the board at future meetings." It was learned that some executives would go along with the plan "in principle" but have not committed themselves as to details.

The actual number of cars involved, and the mechanics of acquiring and paying for them, has not been made public. Railroad presidents who are not members of the AAR board expected to be advised of the plan's details late last week.

Reports in financial circles have it, meanwhile, that some proponents of the plan would bring the government in as a guarantor—not at the outset, but only in a limited way if necessary to avoid higher interest charges.

Deramus Calls for Employee Support

Missouri-Kansas-Texas layoffs and transfer of personnel are "not only alarming but disagreeable and discouraging to all concerned." So said W. N. Deramus, the road's president, in a letter received by the road's employees last week.

Referring to the road's departure from St. Louis and the labor and staff cuts in Parsons, Kan. (Railway Age, April 1, p. 15), the letter said the alternative to these moves would have had the Katy "dying a slow death."

"We have been trying to cope with what we regard as a real emergency in Katy's life, in an attempt to preserve the company," Mr. Deramus' letter said. "It should be clear that we still have a very tough job ahead of us to keep the Katy alive. We are still working hard to secure the jobs of the employees essential to the operation of the railroad."

Mr. Deramus conceded that "perhaps some of the methods used could have been much better handled." But, appealing for "the help, support and understanding of every Katy employee, customer and community," he added a hope that "our neighbors all

(Continued on page 42)

WILL YOUR RAILROAD BE PREPARED TO GROW?

The ten-year period just ahead is a crucial one for the railroad industry. By every reasonable economic yardstick—anticipated gross national product, population growth, construction activity, steel, chemical, fuel production, etc.—this ten-year period offers undeniable opportunities for growth.

Already, we are cooperating with several roads who have measured this potential. Their conclusions are based on anticipating their equipment requirements well in advance of need. They are laying the groundwork involved through specific year-by-year order planning. Thus orders may be placed sufficiently in advance that deliveries of power will be made when power is required, not months or years later.

On the eve of completing an expansion program that will add forty-two per cent to existing facilities at La Grange, we are in a better position than ever to help you schedule your motive requirements to match your needs. Thus, whether it be new locomotives, upgrading or conversion of present motive-power, unit exchange of components or entirely new products, Electro-Motive can help you plan today for a more rewarding tomorrow.

GENERAL MOTORS LOCOMOTIVES

ELECTRO-MOTIVE DIVISION
GENERAL MOTORS

LA GRANGE, ILLINOIS • *HOME OF THE DIESEL LOCOMOTIVE*

In Canada: General Motors Diesel, Ltd., London, Ontario

FACTORY BRANCHES

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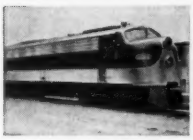
La Grange, Ill.
(factory and parts center)
Halethorpe, Md.
Jacksonville, Fla.

BRANCH WAREHOUSES

Fort Worth, Texas
Minneapolis, Minn.

These Electro-Motive facilities can help you plan now for a more rewarding future

COMPLETE LINE OF EFFICIENT GENERAL MOTORS LOCOMOTIVES

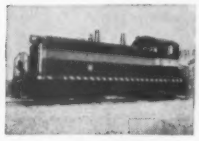


E9 Passenger Unit

F9 Freight or Heavy-Duty Passenger Unit

GP9 General Purpose Unit

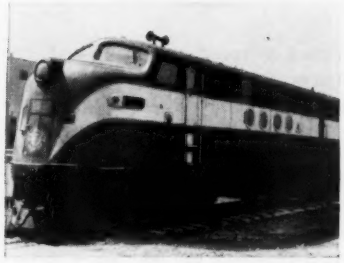
SD9 Six-Motor Road Switcher



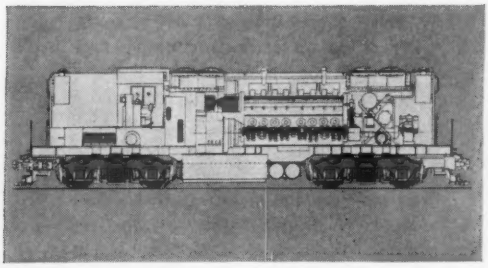
SW1200 125-Ton Switching Unit

SW900 115-Ton Switching Unit

CONVERSION FACILITIES MAKE NEW LOCOMOTIVES FROM OLD



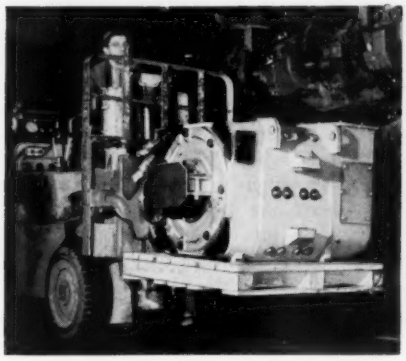
FT as it was delivered to us for converting to a modern GP9.

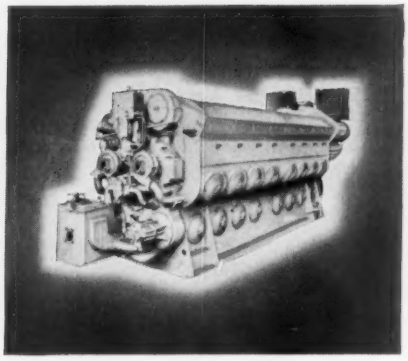


Cutaway showing parts (red) used from FT in conversion process.

Result carries a new locomotive warranty but costs considerably less than a new unit.

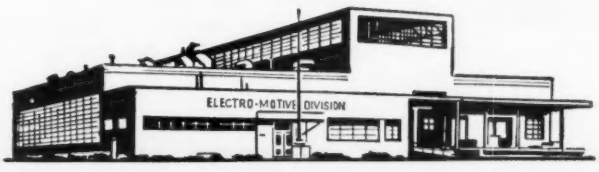
UNIT EXCHANGE REDUCES INVENTORY OF MAJOR COMPONENTS





This unique Electro-Motive service offers major locomotive components on an exchange basis. You don't need to hold a locomotive out of service waiting for an assembly to be rebuilt. You can get unit exchange service from any of the branches listed here to help you operate with smaller inventories and reduce maintenance costs with precision, factory-built components that contain all the latest engineering improvements.

STRATEGICALLY LOCATED BRANCHES

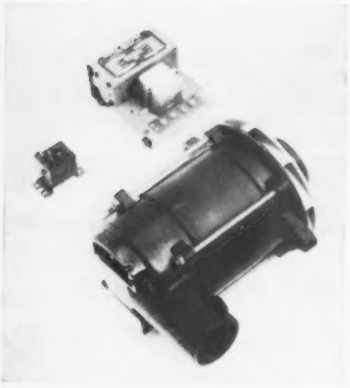


A network of Electro-Motive Factory Branches and Warehouses puts genuine General Motors locomotive parts within 24 hours of any point in the United States. Six of the branches, plus our facilities at La Grange, handle remanufacture of major components with the same factory facilities used in original manufacture.

RAILWAY AGE
The Industry's Newsweekly

WHAT'S NEWS in Products

More New Products on page 23



A-C Power Supply

. . . is self-contained

A 3-kw a-c power supply for mobile lighting and heating requirements consists of an alternator, regulator and rectifier. The power supply package may be used with lighting systems on construction vehicles, power shovels, railway maintenance-of-way equipment, etc.

Operating independent of any other source of electric power, the power supply package may be applied wherever an accessible rotating shaft exists, to meet a lighting, heating, or other non-frequency responsive load.

Specifically intended to be belt-coupled to a rotating shaft, the alternator has an automotive-type three-point mounting for easier installation and adjustment of belt tension. The unit can withstand rotational speeds up to 10,500 rpm. It does not require interconnection with existing electrical systems.

Preset at the factory, the regulator is a finger-type unit and capable of holding output voltage variation to plus or minus 3 per cent from no load to full load, and from minimum to maximum alternator speeds.

Encapsulated for moisture resistance, the Vac-u-Sel field excitation rectifier comes with brackets for ease in mounting. Rectifiers are also available for powering small power tools utilizing series universal motors.

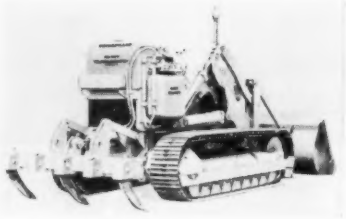
Voltage output of the system is constant with varying frequency, single-phase a-c power. Sufficient power to light 30, 100-watt lamps is provided by the 3-kva alternator. *Specialty Motor Department, General Electric Company, Dept. RA, Schenectady N. Y.* •

Mobile Heater

. . . uses diesel fuel

The Duo-Therm 725-R mobile heater has a built-in cooking and warming top. It is said to operate efficiently on AAR diesel fuels. Output capacity is 53,000 Btu. It can be equipped with an automatic power-air blower which is estimated to save up to 25 per cent on fuel costs. The blower turns on and off automatically. A directional grill permits heat to be directed where it is most needed.

The unit has an all-steel welded heat chamber for quick pick-up and transfer of heat. A large outer door gives quick access to the lighter door. Its dual chamber burner is equipped with a 6-stage progressive air injection unit, in and above the burner. The casing has a baked enamel finish. Optional equipment includes tanks of 7-, 15-, or 30-gal capacity, mechanical and electrical thermostats. *Motor Wheel Corporation, Appliance Division, Dept. RA, Lansing 3, Mich.* •



Two New Rippers

. . . for tractor mounting

Designed to speed bulldozing and loading operations, two new tractor-mounted rippers have been added to the caterpillar line of grading equipment. The larger No. 6 ripper is designed for use on the manufacturer's D6 tractor and No. 977 Traxcavator. The smaller model, No. 4, is designed for the No. 955 Traxcavator. When mounted on the Traxcavators, the rippers are operated by standard hydraulic controls by making use of a separate valve and control lever mounted on the hydraulic tank. When the No. 6 ripper is used with the D6 tractor, it is hydraulically operated by the No. 46 or No. 44 hydraulic control and a separate hydraulic cylinder.

Three alloy steel teeth with replaceable tips are normally installed, but provision has been made for installation of two additional teeth, if desired. The new rippers are rugged enough to permit the full power of the tractor to be absorbed by one tooth at maximum penetration, according to the manufacturer. When the ripper is fully raised, sufficient clearance is said to be obtained to permit climbing a 30-deg ramp without striking the ground with the ripper teeth. The manufacturer points out that a simple method of ripping directly to the edge of a vertical wall or bank is provided by installing the ripper teeth backward and ripping while backing up.

Points of the new rippers are interchangeable with those used on the Traxcavator bucket. *Caterpillar Tractor Company, Dept. RA, Peoria, Ill.* •

- **Suez crisis has pointed up petroleum-availability problem and has even caused price rises in U. S.**
- **Increased cost of diesel fuel — and possibility of short supply — makes even more important railroads' search for ways to cut consumption.**
- **ALCO locomotives offer to railroads significant fuel savings now.**

YOU GET THE MOST POWER PER GALLON FROM ALCO LOCOMOTIVES

Last year U. S. railroads burned well over 3½-billion gallons of diesel fuel and paid $350 million in diesel fuel bills. In figures of that size any saving is significant. ALCO locomotives provide that saving because they use diesel fuel more efficiently. ALCO's modern turbocharged four-cycle diesel engine and advanced electric transmission get the most ton-miles per gallon of fuel.

ALCO

ALCO PRODUCTS, INC

NEW YORK

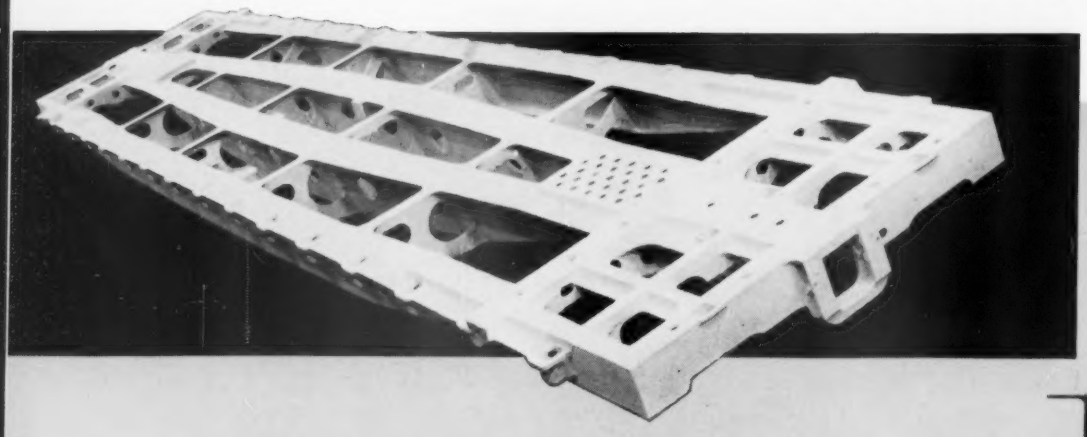
Sales Offices in Principal Cities

MISSOURI PACIFIC LINES

Foresight sets the MODERN PACE

"Look Ahead" Planning of Missouri Pacific Proven by purchases of

Commonwealth



One-piece cast steel flat car underframe arranged for application of end bulkheads.

53'6" long flat car with one-piece underframe.

Commonwealth cast steel pulpwood car underframe with interlocking upright ends.

Pulpwood car with Commonwealth one-piece underframe.

maintenance-free Underframes

The Missouri Pacific Railroad has placed its *fifth* order for Commonwealth one-piece cast steel Underframes which the railroad will use to build 200 70-ton pulpwood cars. In addition, a lot of 50-ton flat cars with Commonwealth Underframes is in service.

Looking ahead to what may well be a continuation of the present period of rising costs, the Missouri Pacific is assured of years and years of maintenance-free underframe service and lower upkeep costs per car.

Many, many years of service have proven that flat cars, pulpwood cars and other types of quality freight cars with Commonwealth Underframes assure superior, better-built equipment. They provide maximum strength at minimum weight, longer life, freedom from corrosion problems and greater availability with increased revenue. Car construction is simplified.

Thousands of flat cars and pulpwood cars with Commonwealth Underframes in service on many leading railroads are proving their exceptionally long life and the sound economy of the investment.

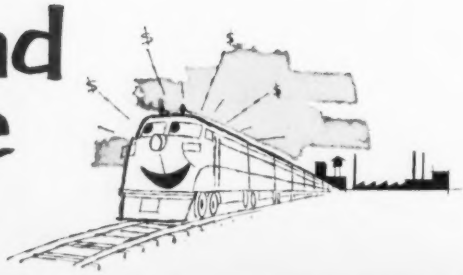
Plan wisely for the future . . . invest in Commonwealth Underframes

GENERAL STEEL CASTINGS

GRANITE CITY, ILL. • EDDYSTONE, PA. • AVONMORE, PA.

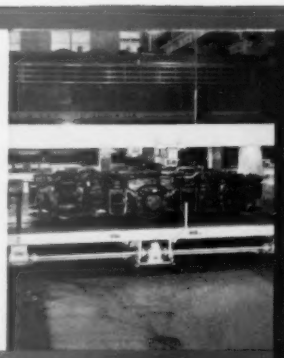
GEARED TO PROGRESS P R I MEMBER

How a railroad can save money!



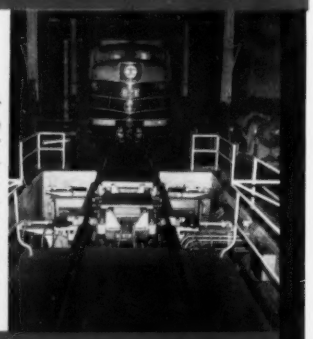
Faster, Lower Cost Truck and Wheel Changes

Whiting Drop Tables reduce lay-up time from days to hours. They save manpower on truck and wheel changes and help assure uninterrupted, profitable operation. Capacities range from 10 to 150 tons—designed to the requirements of the most modern Diesel, electric or steam shops. Write today for Bulletin DT-C-404.



Accurate, Economical Wheel Grinding

The Whiting Wheel Grinder provides a fast, accurate short-cut to restoring proper wheel contour—without removing the wheels. No need to open axle bearing housings—or to remove a single nut or bolt. Eliminates costly wheel removal, truing and replacement. Write for Bulletin MS-C-401.

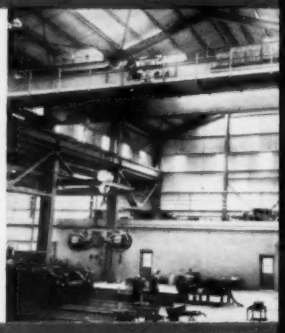


Safer, Easier Lifting

Whiting Electric Portable Jacks put ton-moving muscles at your fingertips. There's a type for every need . . . from special lifters, to all-purpose pit jacks. Tenders, cars, switchers or locomotives . . . all are lifted more safely and at lower cost. Whatever your requirements—from 25 to 80 tons—get in touch with Whiting. Write for Bulletin PJC-403.

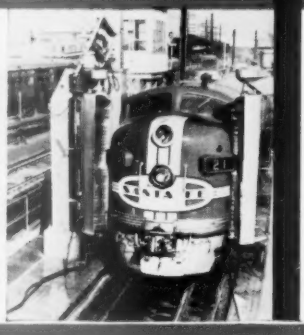
Heavy-Duty Lifting and Moving for the Big Jobs

Whiting Overhead Traveling Cranes lift and move the largest Diesels and even the heavier gas-turbine locomotives quickly and safely. They help put big engines back on the road in record time. There is a Whiting Crane for every requirement . . . a complete range of types and sizes. Write for Bulletin 80.



Gleaming Washes in Minutes

From locomotive to dome-type cars . . . just one operator and a Whiting Train Washer sends an entire train on its way in minutes . . . clean and bright. Cars may pass through a Whiting Washer at the rate of 70 feet per minute. An ordinarily hard-to-clean dome-type car is shining in as little as 75 seconds. Save washing time—cut washing cost, write for Bulletin CW-C-409.



Time-Saving Cross-Over Transport

Whiting Cross-Over Bridges permit fast, easy transport from platform to platform over railroad tracks. They eliminate time-consuming routing around tracks to crossings, and there is no interference with railroad traffic. Complete, uninterrupted movement is possible over the rails and on them. Write for Bulletin MS-C-400.

Whiting railroad equipment makes possible big savings in repair and maintenance. Shop time is turned into road time! More locomotives and cars will be out on the road – working. Get complete information on one or all of these Whiting products. Send for the bulletins listed above.

WHITING CORPORATION

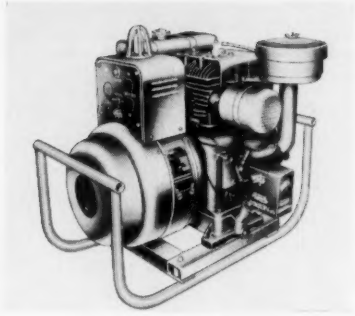
15603 Lathrop Avenue • Harvey, Illinois

WHITING

EQUIPMENT FOR RAILROADS

RAILWAY AGE
The Industry's Newsweekly

WHAT'S NEWS in Products

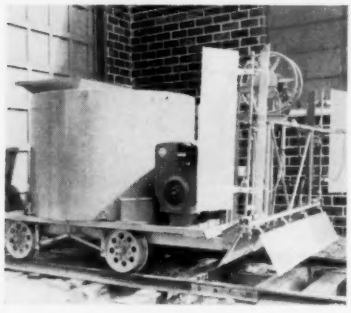


Idling Control

. . . for generator plants

The engine-driven electric generator is equipped with a control which allows the generating plant to idle until a load of 75 watts or more is applied. This means that even when the worker is away from the plant, it will idle automatically until power is required.

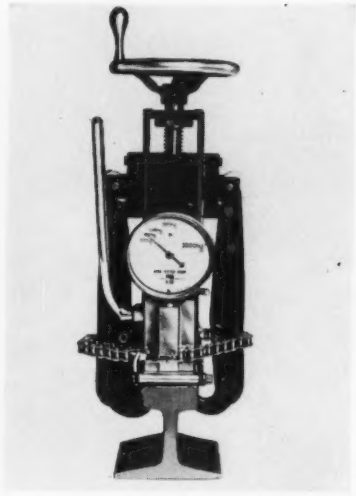
Idling the engine provides considerable saving—in fuel consumption, engine maintenance, and longer engine life. The control is available as an accessory on the 2,500-watt and 3,500-watt Winco plants. Both of these direct-connected units use Briggs & Stratton engines. *Wincharger Corporation, Dept. RA, Sioux City, Iowa* •



Larger Tanks

. . . for spray cars

More water for Fairmont's W73 extinguisher car, W78 weed-spray car and W74 tank trailer is assured by the installation of larger water tanks, each having a capacity of 1,000 gal. The extinguisher car also has been improved by the substitution of a more powerful engine and a belt-driven centrifugal pump. When needed, the weed-spray cars and tank trailers can be equipped with self-contained mechanical agitators. The latter are independent units having their own engines for a double-bladed shaft. *Fairmont Railway Motors, Inc., Dept. RA, Fairmont, Minn.* •



Hardness Tester

. . . for rail in field

A portable tester makes a field determination of Brinnel hardness of rails. Weighing less than 30 lb, the tester is designed for fast, accurate operation by one man.

The device can be quickly attached to and removed from the rail and employs an adapter for holding it in position. High-strength, alloy-steel arms lock the test head rigidly in position for taking the full thrust of the 3,000-kg load. They are said to be easily adjusted to permit the use of the tester at any point on the rail and with various kinds of joint bars. The instrument is self-centering and locks to the head portion of the rail or joint bars so that no ballast digging is necessary.

The test head employs a hydraulic cylinder to exert pressure on a 10-mm ball. When the load on the ball reaches 3,000 kg, a relief valve opens automatically to relieve the pressure. Applying the load two or three times produces the equivalent of holding a dead load for more than 15 sec, as is done with conventional, stationary-type Brinnel testing machines. Results with the portable tester are said to be accurate within the one per cent prescribed by ASTM specifications. No skill is required of the operator—only reasonable care. *King Tester Corporation, Dept. RA, 440 N. 13th st., Philadelphia 23* •

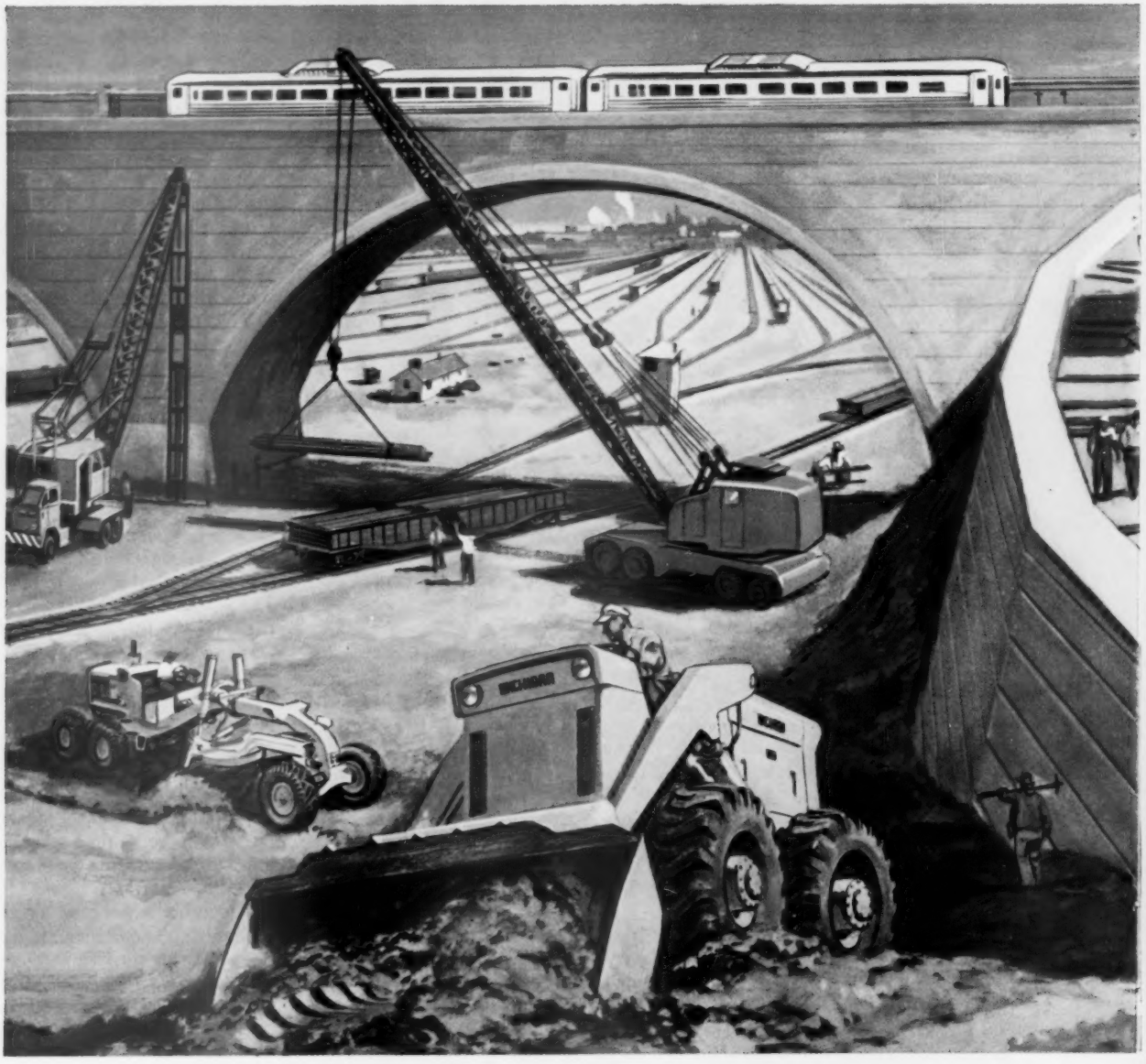
Impact Wrench

. . . for high strength bolting

Meeting requirements for the "turn-of-the-nut" method of high-strength bolting is a new reversible air impact wrench. This Model CP-610 is said to assure proper bolt tensioning, greater clamping force, and stronger joints than was previously possible. The manufacturer reports that, on projects where conditions are hazardous, or for pre-bolting or high-strength bolting, the 20½-lb CP-610 is easy to handle and runs nuts and bolts to uniform tightness in quick time with a minimum of torque reaction transmitted to the operator.

The device is designed for general equipment maintenance, stud driving, and for driving lag screws, self-tapping screws and machine screws. Under special conditions it is said to be practical for drilling and reaming. *Chicago Pneumatic Tool Company, Dept. RA, 8 E. 44th st., New York 17* •

Which Diesel blazes



It's GM...used by over 150 equipment builders

Mechanized maintenance of way—both on- and off-track—has rapidly taken the place of "pick-and-shovel" methods on America's pace-setting railroads.

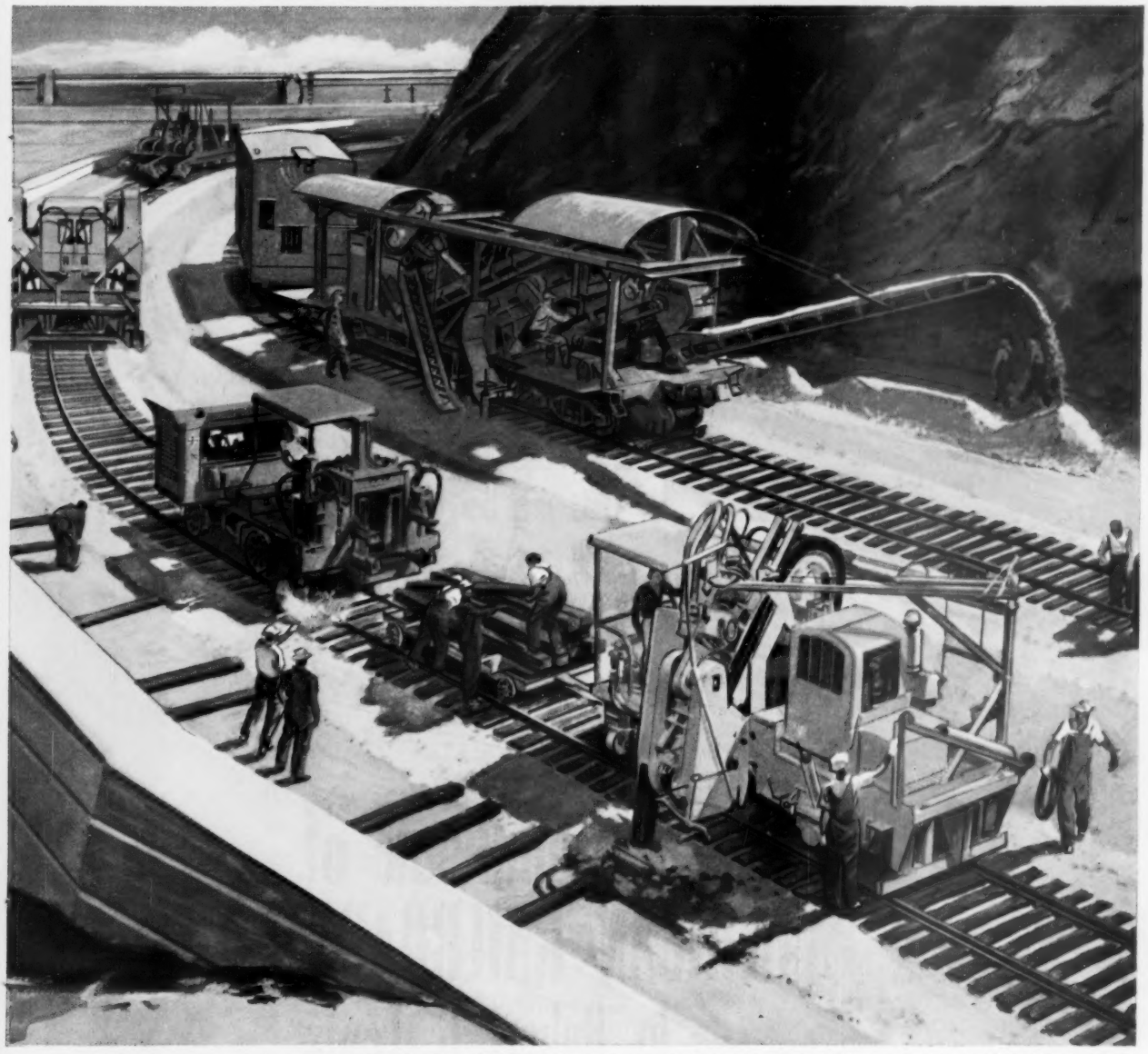
In the forefront of this development is the General Motors Detroit Diesel—little brother of the GM 2-cycle engine that powers many of the world's Diesel locomotives.

Railroads with a sharp eye on costs have found it pays to standardize on GM Detroit Diesels in all types of equipment—from portable air compressors to 250-ton rail cranes. In one size, GM Detroit Diesel engines power the spectacularly successful rail cars that are winning traffic back to the rails *profitably*. In another size, these rugged Diesels turn the generators which sustain below-zero temperatures in modern refrigerator cars.

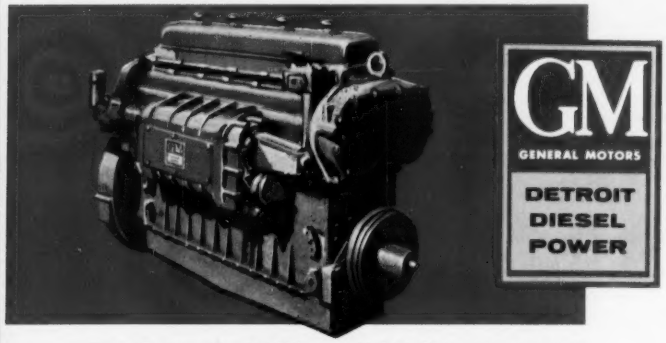
In fact, GM Detroit Diesel engines are the world's most versatile Diesels—available in more than 1,000 applications of power machinery built by over 150 different manufacturers. We'll gladly send you the complete list.

Whatever your job, be sure to ask for equipment powered by GM Detroit Diesel. It's America's First Choice Diesel *because it does more work at less cost!*

the trail on the rails?



Equipment shown includes: Michigan Tractor Shovel; Huber-Warco Grader; Industrial Brownhoist Wagon Crane; American Truck Crane; Budd Rail Diesel Car; Jackson Track Maintainer; R. M. C. Ballast Distributor, SpikeMaster and TieMaster; Matisa Ballast Cleaner



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For every railroader . . . *the only book with all the pertinent facts and figures* any professional or amateur could want for a close-up of America's 113 Class I railroads.

Lehigh & Hudson River

All train and switching movements are handled by identical power—15 Alco 1,600-hp. road switchers. Passenger trains have not operated since 1939.

	1955	1954
Freight revenue	$5,154,495	$5,217,296
Total operating revenue	5,168,592	5,225,717
Net income	312,522	417,958
Operating ratio	69.0%	68.5%
Gross ton-mi. per frt. trn./hr.	38,161	38,965

Robert I. Huyler was elected president of the L&HR in 1956. Mr. Huyler was born in Demarest, N. J., in 1890 and his entire railroad career has been with the road he now administers. Prior to service as first lieutenant, A.E.F. 1917-1919, he was employed in various clerical positions, and, upon his return, advanced from chief clerk to the president and general manager to vice-president, secretary and treasurer in 1953.

Misc. Statistics and Equipment Data:

A&B expenditures:	$497	Locomotives (units):	15
Total for equip. (incl. misc.)	14,149	diesel-elec.: freight	15
Total for road	3,559,288	Total diesel-elec.	108
Rev. tons carried	250,568		15
Rev. ton-mi. (thousands)	1.26	Freight cars:	125
Rev. per ton-mi. (cents)	50.00	gondola and hopper	14
Weight of rail in main tracks:	38.00	caboose	
mi. 100 to 127 lb.		Total freight cars	
mi. 150 and over		Company service equipment	

115

Homer R. Hill

L&HR southbound freight, doubleheading Alco road switchers, approaching the Lackawanna crossing at Andover Junction, N. J.

LEHIGH & HUDSON RIVER

The Lehigh & Hudson River Railway Company is a short but busy bridge line, providing—through the New Haven—a connection to New England for the Central of New Jersey, the Lackawanna, the Lehigh Valley and the Pennsylvania. Each of these roads, and also the Erie and Reading, own substantially all of L&HR stock. The main line extends 85.8 miles from Andover to Maybrook, N. Y., and a branch runs 9.3 miles from Andover to Port Morris over Lackawanna tracks. The L&HR was completely dieselized late in 1950.

114

Handbook of AMERICAN RAILROADS

by Robert G. Lewis

Publisher, *Railway Age*

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- Over 100 action photos
- Every railroad's insignia
- Brief history of each road
- Biographies of current presidents
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Top RR executives, railway supply personnel and railfans have vociferously voted the first edition of this handbook . . . *"the most practical and colorful single source of information on the nation's biggest railroads."* Now! Here it is in the all-new, revised second edition . . . a complete, up-to-the-minute picture! You'll want to spend hours browsing through its exciting pages . . . you'll find hundreds of ways to use it . . . you won't find it duplicated anywhere else in this ever-fascinating, resurgent industry. So why not use the convenient coupon? Order your free 10-day trial copy . . . today!

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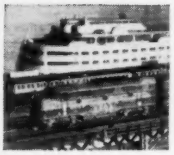
Lubrication case study–

STANDARD HD Oil's ten years' service on the GM & O



This is a case story about the performance of STANDARD HD Oil in eight power units on the Gulf Mobile & Ohio over the last ten years. These eight EMD units pull "hot shot" passenger trains, including the famed "Abraham Lincoln" and the "Ann Rutledge," between Chicago and St. Louis. The units roll up 18,000 to 20,000 miles per month. They travel the 285 miles of the route in less than five and a half hours, including station stops.

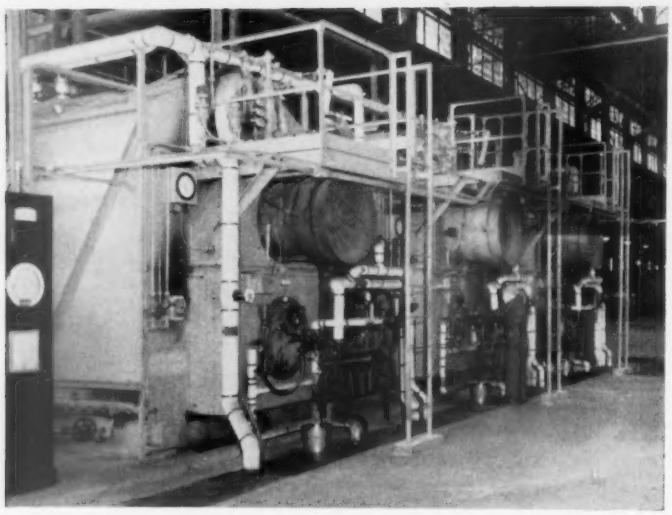
Recently one of these units was rebuilt and converted to a higher horsepower rating. It had operated over 500,000 miles without mechanical failure *and without crankcase drain.* Inspection revealed that moving parts were free and in excellent working condition. Little or no wear was observed, and minimum deposits were found. Parts were reinstalled and the unit was returned to service. This is a real tribute to GM&O maintenance and to STANDARD HD Oil.

STANDARD HD Oil can deliver this kind of service for you. Find out how. Write or call Railway Sales Department, Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY
(Indiana)

STANDARD

How New Power Plants Are Cutting



Three new oil-fired boilers at the D&H Colonie diesel shop require only one man for each trick

Smaller packaged steam generators at other locations

"With those three boilers we're saving about $180,000 a year. Since the total cost, including air compressors, oil-storage tanks and other necessary facilities, was less than $345,000, you can see we're getting a pretty good return on our investment."

The speaker was Alden W. Cruikshank, plumbing and heating supervisor of the D&H. He was standing in the main building at the road's Colonie shops north of Albany, N. Y. Subject of the comment were three modern oil-burning boilers recently installed in a corner of the building.

Three Boilers, One Man

The three boilers, explained Mr. Cruikshank, represent a total steam generating capacity of 90,000 lb per hr. Only one attendant was in evidence. "That's all we need at one time," he said. "We have four stationary engineers here. That's one for each trick, plus a relief man."

Mr. Cruikshank, with a Railway Age reporter in tow, had just completed a tour of the Colonie shops. Here the road makes heavy repairs to locomotives, and also has freight and passenger car repair shops, a large storehouse, a shop for repairing maintenance-of-way work equipment, signal and bridge and building shops, and reclamation facilities.

Not long ago there was also a large roundhouse, and the main shop rang with the noise and clamor characteristic of a steam locomotive shop. Now the D&H is completely dieselized, the roundhouse is gone, and operations proceed in the relative quiet of a diesel repair shop.

The inspection showed precisely what is involved when an obsolete coal-burning steam power plant is replaced with modern, semi-automatic oil-burning boilers.

New Source for Water

The tour actually started a mile and a half away, on the shore of the Hudson river. Here Mr. Cruikshank pointed out a small frame structure on the river bank. Until the new steam plant went into service, all water requirements at the Colonie shops were obtained from the Hudson river by a motor-driven 800-gpm pump in this building. "In steam power days," explained Mr. Cruikshank, "water requirements at Colonie amounted to a million gallons a day. Now they are down to approximately 100,000 gal."

In planning the new power plant, consideration was given to the possibility of obtaining the reduced water requirements from another source. This problem was simplified by the fact that an 8-in. water line serving the nearby town of Watervliet, N. Y., extends across the railroad's property at Colonie. "It was a simple matter," said Mr. Cruikshank, "for us to cut in a 4-in. line to get our requirements for general service, and an 8-in. line to get water for fire protection."

This switch in water supply permitted abandonment of the pumping station on the Hudson.

What Was in the Old Plant

The old power plant is now silent and deserted, awaiting dismantling. Here was a long line of hand-fired coal-burning boilers, several large steam-driven compressors, a steam-driven turbine for power generation, and, in a pit, a steam fire pump. "Operation of this plant required 37 men," explained Mr. Cruikshank.

Costs

Other facilities abandoned included a 318,000-gal water storage tank, a 100,000-gal locomotive supply tank, and a 50,000-gal tank to keep pressure on fire lines in case the steam fire pump should be out of service.

What steam requirements had to be provided for in designing the new plant? They're substantial. Heating of the shop buildings and passenger coaches takes a considerable amount. Then there are the requirements for the diesel facilities—the filter washing equipment and the parts cleaning kettles. Also steam must be provided for heating cars of fuel oil to be unloaded, and heating No. 6 oil in the storage tank. A steam supply must also be available for operating a steam turbine drive for a new fire pump.

	Cost of Installation	Estimated Annual Savings	Percent Return on Investment
Rouses Point	$25,233	8,735	35.5
Whitehall	30,668	6,841	22.3
Mechanicville	21,366	4,208	19.7
Binghamton	23,768	10,500	44.2

Mr. Cruikshank described the new steam generating equipment. Two of the three new boilers have a capacity of 33,000 lb per hr each, and the third, 24,000 lb per hr. They are all Keeler water-tube boilers with Todd burners. There are also two Worthington centrifugal boiler-feed pumps. One is motor driven while the other, for emergency use in case of a power failure, is driven by a steam turbine. Bunker C oil for the burners is pumped, heated and strained by a Todd duplex heater set. Fuel oil for the burners is stored in a new 411,000-gal tank.

New Compressors Are Automatic

Mr. Cruikshank explained how the new steam plant was cut in without interruption of steam service. "On the day this was done," he said, "we had instructors on hand from the manufacturers of the boilers and burners. In the morning the instructors put the boilers in operation. At exactly 12 noon the old steam plant was shut down, and our men simply walked over and took charge of the new plant."

A terminal like this also uses a lot of compressed air. It is needed for train testing lines, brake testing units for coaches, air tools in the car shops, paint spraying, cleaning electric generators on diesels, washing diesel locomotives, and for elevating sand to storage tanks.

Air for Repair Facilities

To take the place of the steam-driven air compressors in the old powerhouse, two automatically controlled motor-driven compressors were installed at different points in the shop area. One of these—a 839-cfm, 150-hp Ingersoll-Rand compressor driven by a GE motor—is in the upholstery shop west of the old powerhouse. This unit supplies air for all the coach and car repair facilities. Such attention as is needed is furnished by a mechanic in the car section.

The other compressor—a 584-cfm, 100-hp Chicago Pneumatic unit—is in the same building as the new steam plant. This compressor supplies air for all the diesel-repair and servicing facilities.

Mr. Cruikshank pointed toward a small Steelox building. "In there is our new fire pump," he said. This turned out to be a 5-in. 1,000-gpm Fairbanks Morse pump driven by an FM 50-hp motor, or, in case of power failure, a Terry steam turbine. The pump controls are manually operated.

The new boiler plant was designed by the E. Keeler Company, Williamsport, Pa., in collaboration with the road's engineering department under the general supervision of P. O. Ferris, chief engineer. H. B. Clarkson, engineer of structures, handled the contracts, and Mr. Cruikshank was in direct charge of the field work.

The entire boiler plant was installed under contract by the Keeler Company, but railroad forces put in all piping beyond the main header and installed the air compressors, the fire pump, all water and fuel lines, the steam lines for heating the fuel oil in the storage tank, and the fuel-oil unloading facilities.

Units for Smaller Shops

Back in the office at Albany, Mr. Ferris and Mr. Cruikshank talked about several other types of modern steam plant installations that are paying off for the D&H. One consists of Amesteam generators, of the so-called "package" type. These are fully automatic, oil-burning plants that supply steam at a pressure of 150 psi, and are put in generally at the smaller diesel shops.

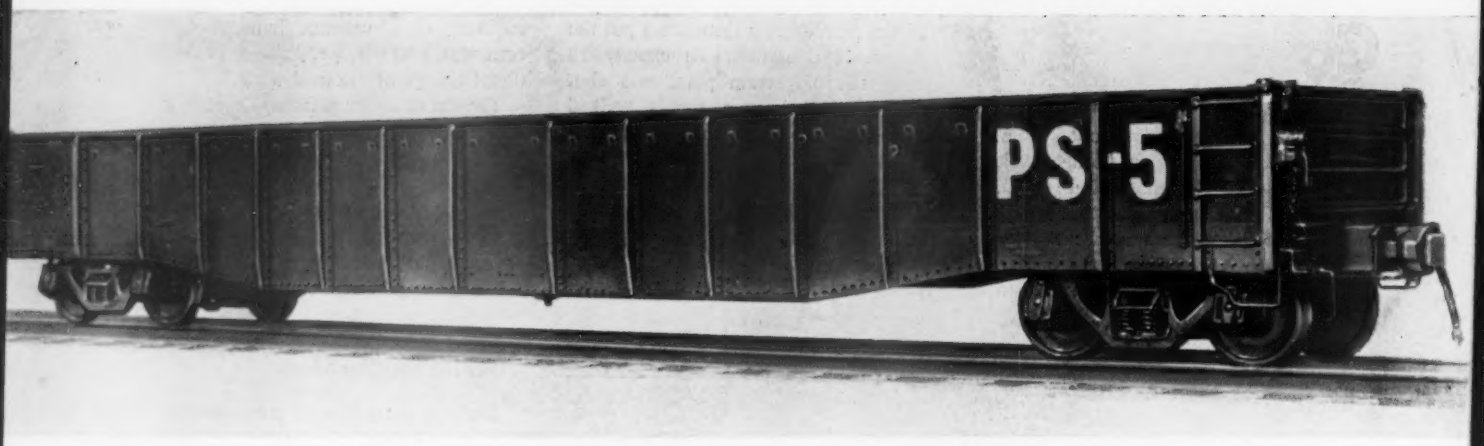
To date, such plants have been installed at Rouses Point, N. Y., Whitehall, Mechanicville and Binghamton, and in all cases they replace hand-fired coal-burning boilers. At Whitehall the Amesteam generator is in an existing boiler house, while at the other points they were installed in existing enginehouses that had been converted for handling diesels. In all cases a 12,000-gal fuel-oil storage tank was installed in the same building. Any attendance required by the Amesteam plants is handled by local shop personnel.

Further Economies

Figures on the cost of these installations, and the savings they are bringing the railroad, are given in the table.

The D&H is also realizing economies through another type of steam plant—low-pressure, automatic, oil-burning boilers for heating stations and freighthouses. The purpose, as explained by Mr. Cruikshank, is to eliminate the cost of handling coal and ashes.

Nine such plants were installed in 1956, and more are on the budget this year. Other things being equal, preference is given those locations where the new plants will bring the greatest savings, although locations where the old boilers are worn out naturally rate high on the priority list.



Now—Standardized 'Gons'

A fifth mass-production freight car is ready—and in fact has been service-tested as long as eight years. It's Pullman-Standard's PS-5 gondola.

Standardization of railway freight equipment has taken another big step with the announcement of two new gondola cars. This week in Chicago, Pullman-Standard revealed its 70-ton PS-5 gondola, available in two lengths. The cars fit into Pullman-Standard's concept of "flexible standardization" which already has produced a total of 110,000 standardized box cars, covered and open-top hoppers, and flats.

Designs Are Flexible

PS-5 gondolas already have been extensively road-tested. Four hundred cars of the 52-ft 6-in. design were put in service by the Frisco in 1949; and 300 65-ft 6-in. mill-type gondolas built to the same basic design went into use on the Rock Island in 1953.

Although the two gondolas are constructed along largely standardized lines, sufficient flexibility of design has been included to permit adaptation of either car to special uses.

Floors, for example, can be wood, welded steel, a combination of the two, or any suitable material. Either fixed or drop ends are available. Side heights are variable according to buying railroads' requirements.

Production-line PS-5's actually will be a car which has evolved from continuing tests and inspections of the prototype cars built for the Frisco and Rock Island. Railroad and shipper requirements, plus continuing follow-up investigations by the builder's sales and service engineering group, have resulted in modification of such features as tiedown location and structural strength of car components.

Pullman-Standard people feel that the PS-5 is fitted to the requirements of railroads and shippers, rather than to those of the manufacturer.

Underframe: The center sill consists of two Z sections welded together the full length of the car. The bolster center fillers are built-up and arc-welded. Included in the heavy-duty underframe construction of the basic 52-ft 6-in. cars are six built-up, arc-welded crossbearers, four pressed-plate crossties and two I-beams.

Floor: Designed to withstand severe impacts and loads without excessive dishing, the floor is welded from 3/8-in. copper-bearing steel plates. The plates are butt-welded on top of the underframe cross-members. Optional floors are available.

Sides: Fishbelly design of the sides provides maximum strength. Side sheets are 1/4-in. plate. Sixteen side posts of 3/8-in. plate are located at the bolsters and cross-bearers and are built with a wider section than conventional posts have, to provide increased strength. Twelve additional posts of 5/16-in. plate are located at the crossties.

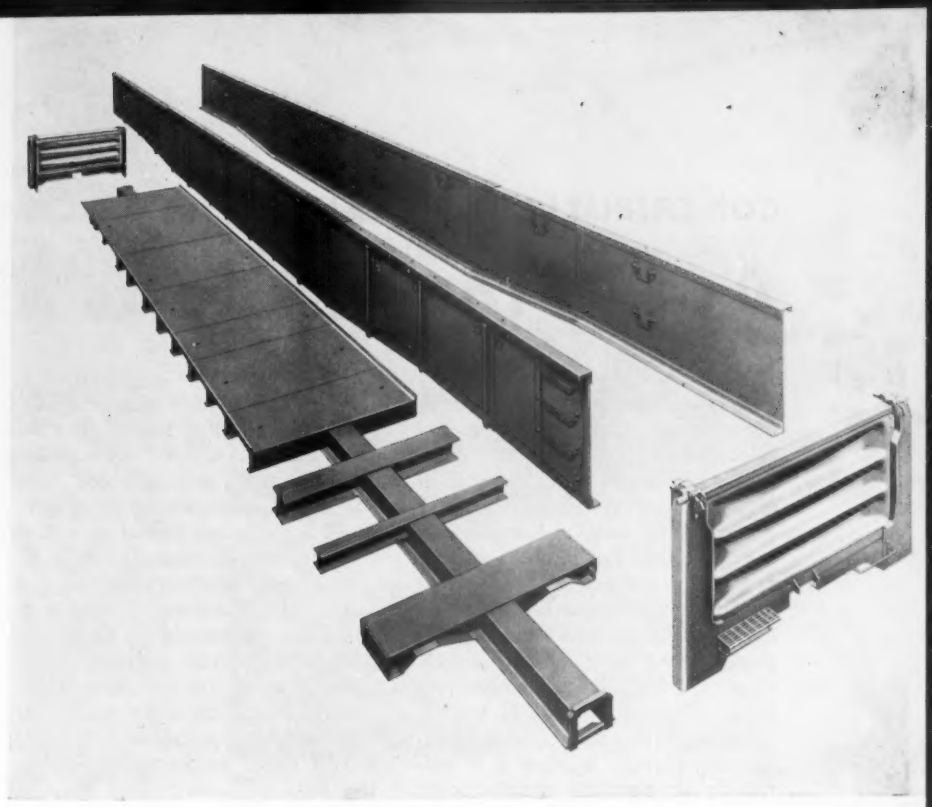
Ends: Drop ends, available as an option, are built of 3/8-in. plate with corrugations 4-in. deep. Corner posts are pressed from 1/2-in. plate.

Lading anchors: Thirty-two hinged stake pockets are provided inside the car, formed of 1-in. diameter steel. Welded to the outside of the side sheets are 65 hold-down clips of 1/2-in. diameter steel, located in accordance with AAR specifications. The longer mill-type cars have 40 collapsible stake pockets and 80 hold-down clips.

HOW THE PS-5 "GONS" COMPARE

	Basic 70-ton car	*70-ton mill-type*
Length inside, ft-in.	52-6	65-6
Length over strikers, ft-in.	54-6	67-6
Length between trucks, ft-in.	43-6	56-6
Width inside, ft-in.	9-6	7-9
Height inside, ft-in.	3-6	3-6
Inside stake pockets	32	40
Hold-down clips	65	80

A STANDARDIZED GONDOLA is the fifth in Pullman-Standard's series of "PS" freight cars. It's available in this 52'6" length and also as a 65'6" mill-type car.



EXPLODED VIEW of the PS-5 gondola shows components of car. ►

Why Standardized Freight Cars?

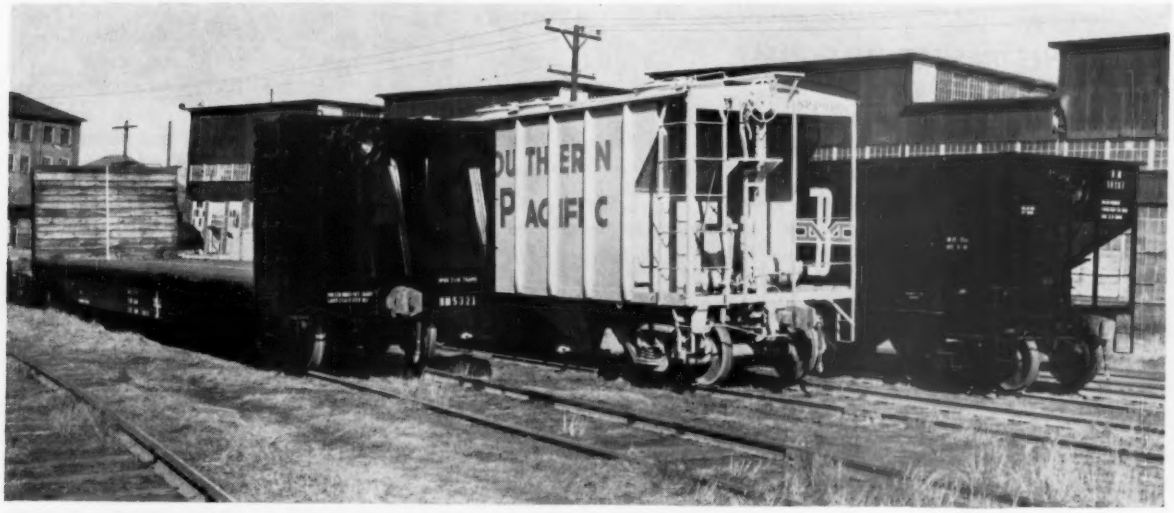
Eleven years ago, Pullman-Standard "broke with tradition"—and offered U.S. railroads a standardized box car, opening a "new era of car-builder-designed freight cars, built to fulfill the needs of the railroads and shippers," recalls the company's President C. W. Bryan, Jr.

"At that time we chose the workhorse of the railroads—the box car—as the logical car for standardization. Realizing that true mass production could be reached only by the complete use of standards, Pullman-Standard designed the car to use component parts engineered and manufactured in its own shops.

"This greater use of its own facilities gave a smoother, steadier and more centralized control in production even though the investment in tools, dies and jigs was costly. This new method, however, developed other advanced techniques and automation principles impossible for us in the construction of custom-built cars.

"Thus the railroad buyer of standardized cars is given the advantage of experienced engineering and specialized manufacturing facilities geared to the universally acknowledged benefits of continuous production.

"One of the major advantages of the best concept of standardization is that it includes flexibility to keep pace with changing requirements."



THREE "STANDARDS"—A PS-4 flat car with bulkheads, a PS-2 covered hopper and a PS-3 open-top hopper stand together at Pullman-Standard's Butler (Pa.) plant.

CONTRIBUTIONS TO RAILWAY RESEARCH–6

At GE Progress Starts with Research

Applied scientific research, which might be termed the next step beyond basic research, is coming to have a similar relationship to railroads. Railroad leaders always are seeking better equipment or tools, and applied research provides that result. From the first use of iron-capped wooden rails to the most advanced designs of today, the railroads have constantly engaged in developing practical applications out of experimental demonstrations.

"Scientific research" alone is an enchanting phrase. Whether it is railroading or electrical manufacturing, men have always been needed with the vision to perceive and the ability and courage to make their visions come true.

After 1892, when the General Electric Company was founded by the merger of two firms, the need for fundamental research was quickly evident. Just as great steel companies find it advantageous to acquire ore fields of their own, why should not General Electric engineering possess a source of its most essential raw material? So, in 1900, the GE research laboratory was started with Dr. Willis R. Whitney, a young professor at Massachusetts Institute of Technology, as director.

Today this research laboratory is a multi-million dollar facility, and its growth continues. The staff numbers approximately 1,400, of whom some 450 are scientists and engineers. A dozen buildings are located on a 200-acre tract outside Schenectady, N. Y.

This GE laboratory is engaged largely in fundamental research, where new information is sought, in many cases, without particular application in mind. The span between the scientist in the lab and the eventual consumer of a particular product is usually large. In the railroad industry, however, several fields may be pointed to where fundamental research has already made or may in the future make significant contributions. Among these areas are combustion processes, insulation, metals and ceramics, and electronics.

Understanding a Flame

In chemistry there is at present an active program of basic research in combustion, aimed at better understanding of the mechanism of propagation of flames and detonations, the chemical reactions occuring in flames, the detailed mechanism of the ignition of liquid fuel and the burning of single fuel droplets. The mechanical investigations section is concerned with such problems as friction, shaft vibration, oil film dynamics, damping, balancing and turbine and compressor-bucket vibration. Earlier work in these fields already is part of the company's design procedure.

New problems arise continually, though, as speeds, sizes, temperatures and energy densities increase in machines. All require new solutions.

For example, journal-bearing oil films in the normally operated bearing are well understood. However, if a periodic disturbing force is added to the shaft, a new series of phenomena is presented for study. Results of such studies may be needed and applied in the near future.

The whole field of electrical insulation is another major interest to any producer or user of electrical machinery, including railroads. Recognizing this, GE departments worked together and in 1954 announced "Irrathene" irradiated polyethylene plastic—a tough, moisture resistant, chemically inert material able to withstand temperatures in excess of 350 deg F. Resistance to stress cracking in the presence of a broad range of commonly used chemicals is another characteristic.

A similar search for new insulating material also led, in 1954, to the announcement of a new thin-film, heat-resistant wire insulation for electric motors, Alkanex enamel. Simply put, the enamel permits engineers to increase the horsepower of motors without increasing their size. It raises the limiting temperature for long-life equipment from approximately 220 deg F to at least 300 deg F, a point of real significance as modern equipment moves into operating conditions where temperatures rise steadily higher. The new upper limit of Alkanex enamel promises to solve many design problems as far as heat is concerned.

Creating New Materials

Today's technological advances are marked by increased dependence on the properties of materials, rather than on the designer's ingenuity in putting

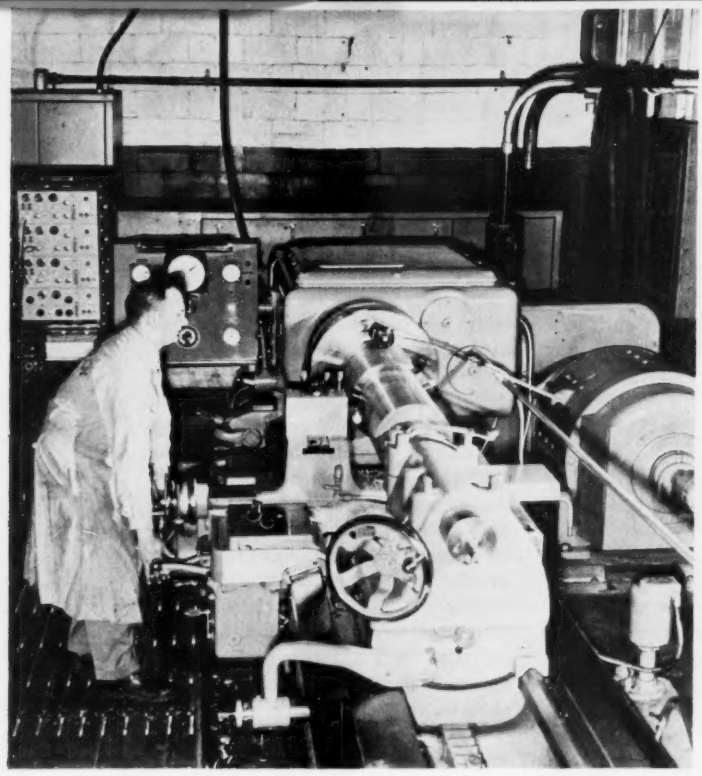
WHY THIS RESEARCH SERIES?

The idea behind this Railway Age series, under the general heading of "Contributions to Railway Research," is to illustrate how manufacturers in the railway supply industry carry on intensive research activities in the interest of the railroads.

Such research, so vital to progress, is helping continually to advance the science of railroading and keep this industry apace with others. Its achievement is a cumulative job, in which the AAR and many individual railroads participate.

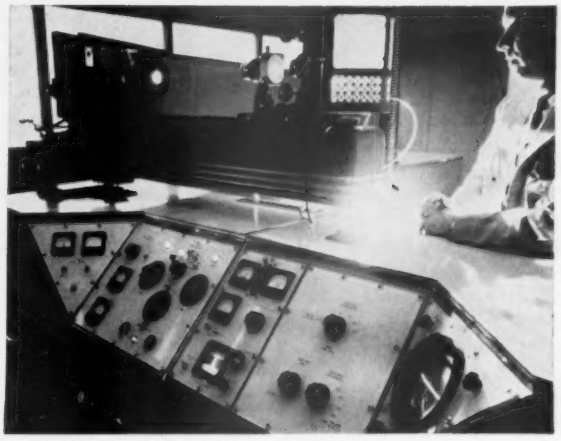
These articles are based on material provided by representative companies. They do not undertake to cover all research in the supply industry or even any one segment of it. The series nevertheless shows convincingly the impact on the railroad industry, and thus on the whole American economy, of the continuing research going on in the industry to make more efficient operation possible.

This is the story of General Electric

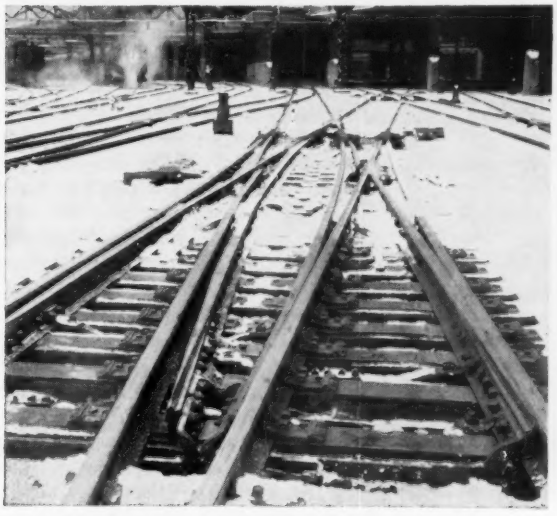


MACHINABILITY of test materials with various grades of carbide tools is studied in GE's Metallurgical Products Department at Detroit. Electronically controlled, the big lathe is also used to determine carbide life and obtain new information on speeds and feeds while machining.

Shaping the Development of New and Better Products, next to Personnel, is GE's Prime Investment in the Future.



SPECTROGRAPH aids in precise examination of elements in powder form. This is another tool of GE research—used in developing grades of cemented carbides.



ELECTRIC SNOW MELTERS, shown here in place at Cleveland Union Terminal, are a practical product that resulted from new invention. Permitting switch operation under adverse weather conditions, the electric switch heater is one of the components applied in the mounting applications of reliable centralized traffic control systems.

BIG FLASH shows the destructive force and fire hazards that occur when an oil circuit breaker fails to interrupt a short-circuit far beyond its rating. Such tests illustrate why engineers carefully select breakers to protect their personnel and plant equipment from the tremendous available short-circuit capacity of today's power systems.

parts together. Further advances depend on new materials which can withstand high temperatures because many devices already are pushing the limits of their temperature tolerance. For some time the GE laboratory has been pressing forward a many-pronged research effort in high-temperature alloys, new magnetic materials, conducting metals and ceramics.

To illustrate the scope of this work, two years ago the research lab dedicated a new $5 million facility designed to speed advances in metallurgy and ceramics. In this new building, standard factory-size equipment is operated alongside special equipment, all under laboratory conditions. Emphasis is on measurement and control, and freedom from production schedules to produce new materials. The building's large size (75,000 sq ft) and general appearance spring from the fact that many ideas for new materials and processes arising from basic research must, before they can be used, be tested on a

scale approaching actual industrial conditions. Thus the new facility helps speed transition from laboratory to production lines.

Still another work area is the field of electronics, a subject of increasing importance to railroads. The laboratory has contributed major advances both in the electronic tube and its counterpart, the transistor.

Over the years, science has found two methods of accomplishing important electronic jobs, such as rectifying currents and amplifying signals. The first method, now a half century old, is the electronic vacuum tube. The second, the fast-rising transistor of the past decade, uses electrons moving in a solid. Both are important and promise to remain so. Tubes can operate at much higher temperatures; transistors have longer theoretical lifetimes. GE scientists continue to work on both.

In transistors, a recent development is a new method of controlling the distribution of impurities, called the "meltback" process. This makes it easier to manufacture transistors with useful power gains at higher frequencies. On the electronic-tube side of the ledger, the laboratory has developed electronic components, including tubes, which operate at previously unheard-of temperatures. A new minature ceramic tube, about the size of a cuff link, has demonstrated it will withstand temperatures of 900 to 1,500 deg F. Meanwhile, other electronic circuit components have kept pace.

One major benefit of these findings is the promise of more reliable electronic equipment for use in all types of high-temperature applications. Nearly a dozen scientists at the research lab made substantial contributions over a period of some 15 years to these developments.

Lighting for Efficiency

Railroad lighting dollars have had few competitors in improving the safety and comfort of users and employees, increasing productivity and quality of work and generally indicating that railroads are in business —ready to serve the shippers and passengers. New and better lighting has been developed with the aid of both basic and applied research, with railroad engineers doing much to accelerate progress.

Some of the developments of GE research now in progress include lighting for television applications for classification yards and high-frequency fluorescent lighting. Currently a project on signal lamps is expected to produce a simplification in lamp type required; and work on a new locomotive headlamp, with many improved features, is virtually completed.

Recent and now fully developed results of research include means for doubling the output of fluorescent lamps, quartz lamps for outdoor lighting and for heating as required to expand gears for application to shafts. For yard lighting, lamps with sealed-in reflectors that will not get dirty in service provide a new concept in lighting. High-intensity, high-efficiency mercury lamps now have improved color. A floodlight with a narrow, 14-deg beam makes it possible to overcome that costly habit of using extra heavy units which in turn require heavy expensive supporting structures.

Railroad electrical engineers and their skilled associates are either thoroughly familiar with these developments or know where to obtain the facts and how to apply the equipment properly. Perhaps the major obstacle to overcome is the traditional habit of demanding husky units that entail both excessive first costs and excessive maintenance expense.

Machining Methods Improve

The railroad industry—allied with the machine tool industry through its maintenance operations and through machine builders—has gained directly and indirectly through the development of cemented carbides and associated special machining knowledge. These developments have raised machining or metal cutting production an average of more than 20 to 1. Today, carbides are instrumental in machining metals faster and more efficiently.

Changes in machine tools and practices, resulting from carbides, have provided railroad shops with better machines and techniques. As a result, more rolling stock is kept in service longer. Equipment time in repair shops has been reduced as much as 60 per cent. Cemented carbides first were developed in Europe as a superhard material to draw fine wire; but the material shortly caught the attention of GE metallurgists. Their work, dating from prior to 1928, led, in time, to pioneering the introduction of cemented carbide to American industry. The new material began to be used appreciably in 1930. Research has continued, however, bringing about the modern carbides in use today.

In railroad shops, carbides currently are used to machine gray iron castings despite sand pockets; low carbon, high carbon and stainless steels, brass and tough bronzes. Carbides not only have been adapted to use on new machines but also on old machines in good condition with startling results. The super-hard material is used to machine wheels, axles, locomotive cylinder castings, driving wheels, pedestal shoes and wedges, driving boxes and other jobs too numerous to mention. It also is being used to cut tougher alloys employed in the newer turbine type locomotives.

Rehabilitating locomotives at one shop, as an example, was reduced to a four-day job because of the increased output derived from carbides. This same road found it no trick to process about 12 of these Class 4 jobs per month.

In another railroad shop, machining coupler pins of open hearth steel placed great strains on steel tools because of soft spots in the metal. The tools often broke at the beginning of the turning operation. With the shift to carbides, production increased materially. A carbide tool can be used steadily for eight hours to produce 25 to 30 coupler pins per day before any resharpening is required. Previous tools required servicing at least four or five times daily.

A recent development of GE carbide research has made possible the successful use of a special milling machine capable of truing locomotive wheels without taking the wheels off the locomotive.

The machine, developed by Standard Railway Equipment Company, is mounted in a pit below the rails. In operation, it lifts the locomotive and trues-up two wheels at a time. Success of the cutting job is due to special button-shaped Carboloy carbide cutting tools. The cutting operation is so fast that 18 pairs of wheels can be serviced in one day. Thus, locomotives often can be serviced during their "turn-around" wait without taking them out of service. Ordinarily, such a job would require taking the wheels off the locomotive, machining, then reassembling—a chore involving three or four days.

Still another development is ce-

mented oxide, a ceramic-like material which when used as a cutting tool enables finishing machining operations to be done at speeds as high as 7000 fpm. Although not yet evaluated for railroad machining operations, due to its newness, the material already is being applied successfully in other segments of the machining field. Tests to date indicate the material can be employed on machines capable of cutting speeds as low as 300 fpm for some applications. The close-tolerance, mirrow finishes provided by cemented oxides in some instances closely approach those obtained through grinding.

Heaters Keep Switches Open

The pressing railroad need for on-time, all-weather performance spotlights another result of GE research and invention. Switches must operate efficiently despite the presence of ice, snow or sleet; and means have been developed which provide the added insurance of quick and safe operation under all weather conditions. Electric switch heaters accomplish this purpose, and have the advantage of being adaptable to CTC systems.

A metal sheath tubular heater is the heart of the electric switch heating system. This heater consists of a coil of high quality resistance wire embedded in insulation in a metal tube. This arrangement, plus the seals and terminals in conjunction with a terminal housing, virtually eliminates oxidation of the coil. Heaters have actually operated without harmful effect while completely immersed in water.

Any electrically operated tool or piece of equipment is no better, of course, than the power distribution system upon which it depends. At the same time, because such systems are so commonplace, they are frequently overlooked or neglected. Such lack of care would not be tolerated in the case of air, steam or water lines where leaks are obvious.

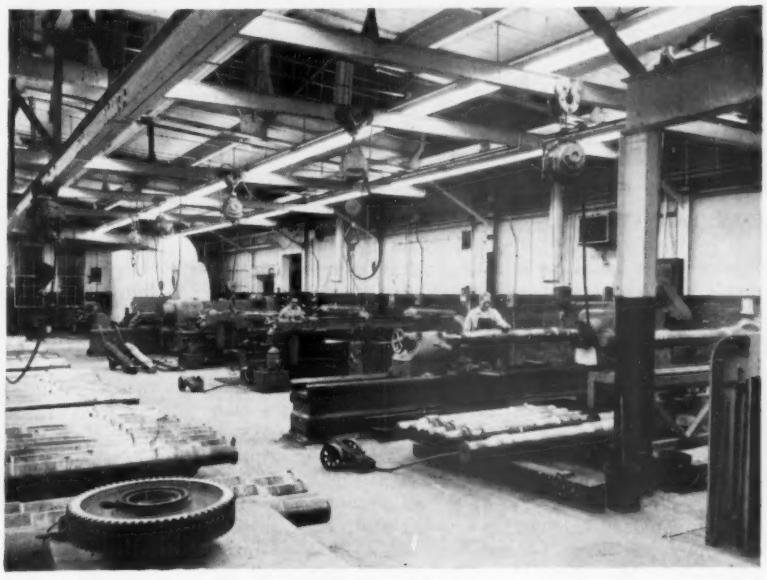
Much research and study have gone into the analysis of power distribution systems to develop precise uses for precise needs. Fuses and air circuit breakers are an integral part of this picture.

Back in 1952 GE dedicated a new $10 million engineering facility in Philadelphia—a fact-finding switchgear laboratory, since expanded 50 per cent—to help its engineers develop adequate standard switchgear equipments far ahead of actual and future requirements.

Since the lab opened it has placed new levels of power and speed in the hands of electrical engineers and scientists. New equipments have been developed and proved under simulated field conditions. Subsequent field installations have confirmed the value of this laboratory's "pre-testing" approach. Just as one example, the time a switchgear circuit breaker is allowed for interrupting a short circuit has been shortened further, down now to about 1/20 of a second. Not many years ago, a half second was considered good. At the same time, the ratings of large circuit breakers have been increased dramatically.

Power transformers have long been a major GE research "area" at Pittsfield, Mass. This department developed, and now manufactures, the special locomotive transformers for use with the company's all-electric locomotives. As improvements are

How Modern Lighting Makes for Efficiency



ABOVE: A railroad axle shop with old style lighting.
BELOW: The same axle shop with modern lighting.

made in standard power transformers they are incorporated in the design of locomotive transformers, helping assure greater reliability. In addition, primary development work in the cooling field has resulted in more efficient and lower weight locomotives for the same horsepower.

Locomotives and Cars

Of all GE applied research, development, design and construction work, probably that best known to railroad men is that of the company's Locomotive and Car Equipment Department—the Erie, Pa., Works.

Sixty years of pioneering development activity in this department has included a broad range of commercial applications. The first electric locomotives were built in 1895 for the Baltimore & Ohio. Gas-electric rail cars followed; then, in World War I, the first experimental diesel-electric locomotives. From 1938 to 1946 the company worked with nine railroads and Babcock & Wilcox in efforts to develop a coal-burning steam-turbine locomotive. Meanwhile, the department developed and supplied electrical equipments for passenger trains, including the early lightweight streamliners of the mid-thirties. Research in the laboratories at Schenectady, and in the Turbine Division, aided in the development of new alloys for gas-turbine blading. This led ultimately to improved materials for the gas-turbine electric locomotive power plant.

Most recently, research at Erie has ranged to new fields. Within the past five years mica mat has come into wide use in insulation systems of traction generators and motors for locomotive and car applications. This material, combined with fine glass fabrics and silicone resins, has made economically possible insulating systems able to resist temperatures in excess of present Class H limits.

Silicone rubber putty, remaining flexible even at high temperatures, has been successfully applied as a permanent seal at critical points in traction equipment formerly susceptible to moisture and dirt. Silicone rubber tape has been developed as a waterproof, high-temperature insulation material. Teflon sleeves have been applied successfully as brush-holder insulators.

Integration of these insulation materials and new techniques has made possible the design and manufacture of traction generators and motors that produce greater tractive effort per pound, occupy less space, withstand more abuse and generally operate more successfully.

A higher hardness level and more uniform hardness of tooth flanks and roots has resulted from the introduction of submerged spray-quenching in the heat treatment of gear teeth. This important step in gear manufac-

(Continued on page 42)

Railroading  After Hours with Jim Lyne

GAS TAX FOR 'EL'—Two of my Chicago friends—Arthur Cowles and Volney Fowler—have given me somewhat of an argument on the note I had here, saying a kind word for a proposal to use some gas tax money to help support the Chicago 'el'.

Neither of them believes it is logical for non-users of a transportation facility to be taxed to keep it going—and I agree with them—as a matter of principle. What attracted me to the suggestion was its attention value—like a man biting a dog.

Railroad and transit lines have been helping support other forms of transportation for years, and with very little protest—but here is a case of a publicly owned rail line suggesting that turnabout might be fair play. Now, maybe, somebody will listen. If subsidies are an atrocity for a transit line, they should be recognized as equally so for any other transportation facility.

It bothers me a little to see the suggestion made that railroad commuter lines be subsidized. The way it looks to me—if public money is used to keep a service going that a railroad would be happy to discontinue, then such public expenditure is a subsidy to the commuters or the community, not to the railroad.

"PARKINSON'S LAW"—The London Economist a little over a year ago pulled out of thin air a term to indicate the tendency it noted of government bureaus to add 6 per cent more employees each year, whether their work load increased or not. The magazine facetiously called this observed trend "Parkinson's Law," and the term is coming into general use. An article in the April Advanced Management magazine suggests that this Parkinson affliction isn't limited to government bureaus, but attacks private organizations as well. I don't recall ever having seen signs of this malady around the railroads, but it might be well to keep an eye open—just in case.

GREYHOUND ON TV—I heard the Greyhound bus program (Steve Allen) on TV the past couple of weeks—the theme being something like, "let us do the driving for you," a slogan just as applicable to train travel as to bus riding. Greyhound with its nationwide service can go on nationwide TV with more direct return than any individual railroad could—but certainly with no more salable service to popularize than the railroads have. Greyhound's Arthur Genet is an energetic salesman, as he proved when he was in the railroad business.

WHY IT'S A "PRO"—Many readers have written to me in answer to Freight Agent H. L. McKay's question as to why a freight bill is called a "pro"—among them Auditor of Freight Traffic E. J. Scahill of the Rock Island; H. R. Eide, auditor of revenues of the Minneapolis, Northfield & Southern; and Philip Schwartz of the B&M. All answers are to the same effect—the term comes from "progressive" and refers to the consecutive numbers assigned to the bills for easy identification.

Mr. Schwartz wants to know whether I know what "schedule" means when applied to something besides a timetable. The answer is: Yes—it also refers to railroad agreements with the labor organizations. Are there any other meanings?

1956 Railroad Purchases Totaled $1.9 Billion

Class I railroads in 1956 spent $1,883,848,000 for fuel, materials and supplies, excluding equipment, the Association of American Railroads has announced.

This was an increase of $246,773,000, or 15.1 per cent, above such expenditures made in 1955. Of that increase, approximately $112 million was due to higher prices, and about $135 million represented an increase in quantities purchased.

For fuel, the railroads spent $476,955,000 in 1956 compared with $453,852,000 in 1955. Expenditures for bituminous and anthracite coal totaled $69,245,000 compared with $76,731,000. Expenditures for diesel fuel oil totaled $363,624,000, an increase of $31,858,000.

Expenditures for iron and steel products amounted to $613,077,000 compared with $509,829,000 in 1955. For miscellaneous products including cement, lubricating oils and grease, ballast, electrical materials, stationery and printing, supplies for dining cars and restaurants, interlocking and signal material, and many other items, the 1956 expenditures totaled $639,034,000 compared with $554,865,000 in 1955.

Forest products cost $154,782,000 in 1956 compared with $118,529,000 in 1955.

Detailed figures are set out in the accompanying tables, which are based on carrier reports made regularly to the Bureau of Railway Economics of the AAR.

ANNUAL PURCHASES OF MATERIALS AND SUPPLIES (EXCLUDING EQUIPMENT)

1924-1955—Class I Railroads (Thousands of dollars)

Year	Fuel	Forest products	Iron and steel products	Miscellaneous	Total	Total less fuel
1924	$471,656	$180,872	$365,610	$324,917	$1,343,055	$ 871,399
1925	459,465	170,305	419,255	343,018	1,392,043	932,578
1926	473,354	186,291	507,302	392,085	1,559,032	1,085,678
1927	438,821	175,729	407,304	374,074	1,395,928	957,107
1928	384,608	160,794	374,575	351,364	1,271,341	886,733
1929	364,392	157,551	406,962	400,630	1,329,535	965,143
1930*	306,500	134,600	304,700	292,700	1,038,500	732,000
1931*	244,500	76,250	188,600	185,650	695,000	450,500
1932*	178,250	52,200	94,550	120,000	445,000	266,750
1933	180,526	42,442	104,327	138,555	465,850	285,324
1934	217,294	64,271	150,671	167,988	600,224	382,930
1935	232,723	57,367	135,397	167,538	593,025	360,302
1936	272,270	76,683	239,486	214,982	803,421	531,151
1937	294,293	104,707	310,658	256,725	966,383	672,090
1938	243,783	56,968	127,141	155,390	583,282	339,499
1939	257,273	69,971	236,338	205,732	769,314	512,041
1940	273,556	82,185	264,480	234,242	854,463	580,907
1941	349,765	103,771	379,951	327,787	1,161,274	811,509
1942	426,335	115,227	353,957	364,292	1,259,811	833,476
1943	527,296	150,255	339,631	377,099	1,394,281	866,985
1944	585,832	158,957	431,692	434,048	1,610,529	1,024,697
1945	555,155	136,962	418,438	461,849	1,572,404	1,017,249
1946	553,153	148,984	416,303	452,115	1,570,555	1,017,402
1947	691,630	171,592	503,906	542,022	1,909,209	1,217,579
1948	833,040	166,488	590,289	593,514	2,183,331	1,350,291
1949	564,159	142,232	454,079	480,936	1,641,406	1,077,247
1950	608,719	121,256	509,506	500,427	1,739,908	1,131,189
1951	621,497	188,186	703,885	662,291	2,175,859	1,554,362
1952	538,659	176,966	513,060	589,065	1,817,750	1,279,091
1953	509,611	176,189	612,584	622,097	1,920,481	1,410,870
1954	433,310	114,430	406,476	470,545	1,424,761	991,451
1955	453,852	118,529	509,839	554,865	1,637,075	1,183,223
1956	476,955	154,782	613,077	639,034	1,883,848	1,406,893

*Railway Age estimates.

Note: "Iron & Steel Products" and "Miscellaneous," 1927-1948, revised to conform with report MS-24, Year 1949.

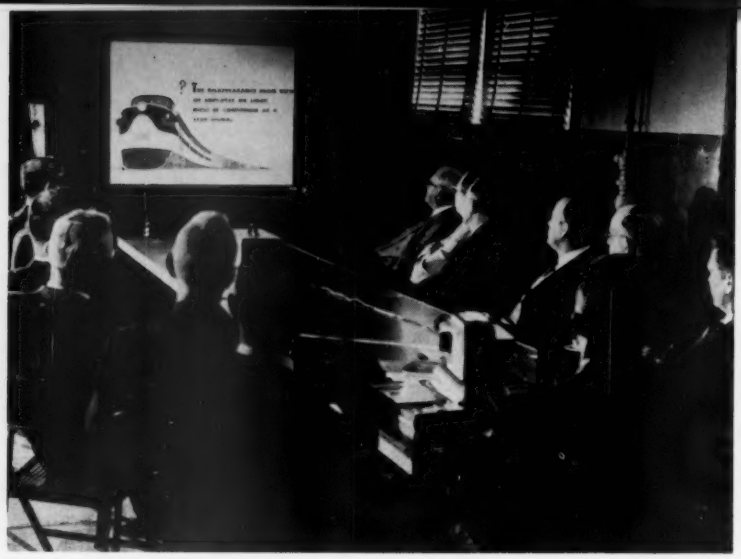
PURCHASES OF FUEL, MATERIAL AND SUPPLIES—

Railways of Class I—Calendar Years 1956 and 1955

Item	1956	1955
FUEL:		
Bituminous coal	$65,873,000	$73,703,000
Anthracite coal	3,372,000	3,028,000
Fuel oil—Residual	24,496,000	28,552,000
Fuel oil—Diesel	363,624,000	331,766,000
Gasoline	10,941,000	10,159,000
All other (coke, wood, fuel for illumination)	8,649,000	6,644,000
Total fuel	476,955,000	453,852,000
FOREST PRODUCTS:		
Cross ties (treated and untreated)	$83,370,000	$53,178,000
Switch & bridge ties (treated & untr.) & timber	24,523,000	19,755,000
Lumber (equipment, rough and finished	36,122,000	34,539,000
Other forest products	10,767,000	11,057,000
Total forest products	154,782,000	118,529,000
IRON AND STEEL PRODUCTS:		
Steel rail (new and second hand, except scrap)	$91,762,000	$95,388,000
Wheels, axles and tires	72,176,000	59,117,000
Frogs, switches and crossings, and parts of same	33,642,000	21,866,000
Track fastenings, track bolts, spikes, etc.	82,161,000	80,929,000
Iron bridges, turntables & struct. steel, all kinds.	10,434,000	8,311,000
Bar iron and steel, spring steel, tool steel, unfabricated rolled shapes, wire nettting and chain, except light coil; boiler, firebox, tank, and sheet iron and steel, all kinds	59,686,000	34,952,000
Forgings and pressed steel parts for locomotives	1,737,000	1,410,000
Car forgings, iron and steel, and fabricated or shaped steel, for passenger and freight cars	48,215,000	35,862,000
Flues and tubes for locos. & stationary boilers	1,458,000	1,326,000
Bolts, nuts, washers, rivets, lag screws, pins & studs	12,558,000	11,854,000
Springs, helical and elliptical, all kinds for locomotives and cars	6,489,000	6,648,000
Locomotive and car castings, beams, couplers, frames and car roofs	95,081,000	72,000,000
Track and roadway tools, all kinds, including hand and power operated tools, miscellaneous roadway material and fencing. Motor, hand, push and trailer cars, and parts for same	20,329,000	16,256,000
Machinery and repair parts	27,002,000	19,125,000
Pipe, iron and steel, and fittings, all kinds	9,865,000	8,939,000
Hardware, all kinds, including nails	11,232,000	10,020,000
Hand & small machine tools, such as drills, taps, reamers, dies, chasers, including air tools & parts	14,656,000	12,822,000
All other iron and steel products, including pig iron, cast iron water pipe and culvert pipe	14,594,000	13,004,000
Total iron and steel products	613,077,000	509,829,000
MISCELLANEOUS:		
Cement, lime, plaster, bldg. brick & other bldg. matls. except cast iron water pipe and culvert pipe	$10,404,000	$9,985,000
Lubricating oils and grease; illuminating oils; boiler compound; waste	45,692,000	40,237,000
Non-ferrous metal and non-ferrous metal products	48,256,000	41,799,000
Ballast	22,407,000	22,531,000
Electrical materials including electrical material for Diesel locomotives	63,341,000	50,102,000
Stationery and printing	38,305,000	31,709,000
Commissary supplies for dining cars & restaurants	35,212,000	34,911,000
Rubber and leather goods	11,778,000	10,639,000
Glass, drugs, chemicals, including chemicals for timber treatment; painters' supplies	48,547,000	47,725,000
Arch brick for locomotives	1,539,000	1,218,000
Passenger car trimmings	15,824,000	15,146,000
Locomotive, train and station supplies	29,719,000	25,722,000
Interlocking and signal material	58,263,000	45,660,000
Telegraph, telephone and radio material	16,929,000	11,947,000
Air brake material	23,002,000	18,580,000
Standard & spec'l mechanical appliances for locos	7,605,000	5,933,000
Automotive equip. & supplies, except diesel mat'l	14,882,000	14,934,000
Diesel material not elsewhere classified	100,822,000	81,900,000
All other miscellaneous purchases	47,507,000	44,187,000
Total miscellaneous purchases	639,034,000	554,865,000
Grand Total	$1,883,848,000	$1,637,075,000

Source: Reports of the carriers to the Bureau of Railway Economics.

What Is Audio-Visual Training?



It's a technique that helps Frisco employees "soak up" rule changes by a simultaneous approach through eyes and ears.

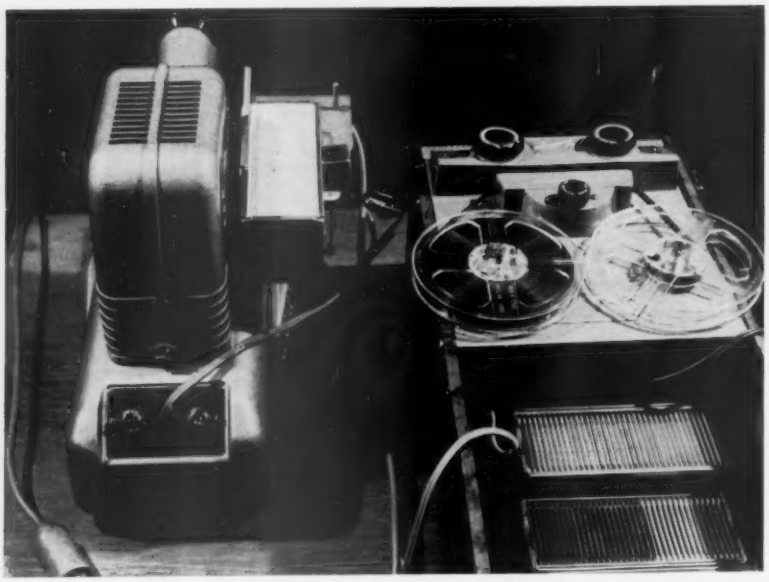
The problem of getting 6,000 scattered transportation employees instructed on a new book of rules, effective March 1, has been solved successfully on the Frisco.

Using 35-mm colored slides, accompanied by companion tape recordings explaining the rules as they are flashed on the screen, the method has proved fast and efficient in getting the job done. Frisco spokesmen believe they have pioneered in this combination of audio-visual aids for system-wide meetings on rule changes.

The use of the tape recording to explain the rules is designed to assure uniformity of explanation throughout the system. At the same time, it permits the instructors to revise and revamp their series of instructions as needs arise.

How They Did It

Because the training program had to reach a large number of people in widely scattered locations, it was decided that a one-unit, compact type of equipment would be necessary. Such a unit was found in the Viewtape projector. It contains a 35-mm projector, tape recorder and speaker in a compact carrying case. Seven of these units were purchased, with one assigned to each division of the railroad.



VIEWTAPE PROJECTOR combines audio and visual aids in one compact unit. The automatic slide changer, fed by a magazine of slides, is attached to projector at left. More slide filled magazines are shown inside tape-recorder at right.

The rules were set in a type face that would be legible and easy to read from a slide projected a distance of 35 ft. Proofs were pulled on various shades of pastel colored paper. Important rule changes selected were graphically illustrated by an artist in light caricature style. The use of various shades of colors and illustrations of various rules was to stimulate and keep interest alive during projection. The rules were then photographed and colored slides prepared. Seven complete sets of slides were set up in the projector magazines.

The companion tapes were then recorded. A rule was flashed on the screen, and the appropriate voice explanation was taped simultaneously. When one complete set of tapes had been finished, an additional six sets were prepared from the original. To better coordinate the slide operation with the tape recording, automatic slide changers with remote controls were obtained. This provided the operator greater opportunity to devote his attention to the overall operation with a minimum of thought to the projections.

To obtain uniform coverage, responsibility for the training was placed with the superintendents of each division. They were instructed in the operation of the equipment as well as the best methods in holding training sessions on their various divisions.

According to Frisco officers, the response to this method of training has been so gratifying that the new book of rules for maintenance of way and structures will be presented in the same manner. Division engineers and roadmasters will be responsible for training sessions on their respective divisions.

HIGHLIGHTS FROM ANNUAL REPORTS OF 36 RAILROADS①

Railroad		Operating Revenues	Operating Expenses	Fixed Charges	Net Income	Current Assets*	Current Liabilities*	Long Term Debt*
Akron, Canton & Youngstown	1956	$ 6,029,390	$ 4,493,081	$ 165,107	$ 400,819	$ 2,619,045	$ 1,523,116	$ 3,981,580
	1955	6,000,067	4,271,478	168,110	642,663	2,652,506	1,618,649	4,148,620
Atchison, Topeka & Santa Fe	1956	590,183,170	447,986,845	7,635,253	70,213,171	195,891,218	108,673,080	189,131,000
	1955	578,034,019	415,379,528	7,805,667	77,564,886	238,043,125	127,743,179	192,939,500
Baltimore & Ohio	1956	465,484,696	375,140,926	19,229,838	30,038,261	120,578,208	85,487,917	491,695,622
	1955	432,061,417	350,415,965	16,527,358	23,918,782	118,319,528	88,275,994	491,177,460
Canadian National	1956	774,800,647	703,303,562	31,782,991	26,076,951	200,334,777	125,394,800	1,173,234,340
	1955†	689,269,788	635,322,884	33,075,128	10,717,689	197,591,847	97,811,328	1,095,808,713
Central of Georgia	1956	44,785,471	35,984,233	1,243,408	3,299,977	14,291,948	8,225,811	49,499,099
	1955	43,159,176	34,538,836	1,203,767	3,183,913	14,257,666	7,094,199	46,248,687
Chesapeake & Ohio	1956	418,727,983	284,496,943	12,505,023	66,735,879	134,789,180	89,683,662	373,358,564
	1955	380,281,057	258,841,416	12,393,584	57,982,747	139,291,409	90,216,727	355,935,699
Chicago & North Western	1956	193,140,157	170,764,150	7,432,314	4,725,240d	47,576,878	45,592,319	215,623,493
	1955	198,717,784	168,237,614	6,880,292	2,386,239	50,846,179**	46,746,340**	206,846,239
Chicago & Western Indiana	1956	#	#	2,616,935	51,805d	3,730,104	2,727,879	83,790,951
	1955	#	#	2,688,123	278,886d	3,645,303	3,001,339	84,375,426
Chicago & South Shore & South Bend	1956	7,774,439	5,649,240	644,586	469,335	2,559,327	1,793,605	1,462,500
	1955	7,445,039	5,325,222	649,178	363,593	3,364,577	1,683,565	.....
Delaware & Hudson	1956	57,409,145	38,619,310	1,960,251	9,066,060	28,054,535	9,987,730	82,790,001
	1955	52,883,917	36,923,125	2,122,890	8,854,874	26,433,363	7,214,916	84,694,003
Delaware, Lackawanna & Western	1956	88,786,209	73,638,923	4,412,874	5,081,519	19,642,741	14,734,268	120,914,079
	1955	82,690,967	70,785,650	4,613,357	985,528d	20,489,874	13,512,254	132,509,313
Denver & Rio Grande Western	1956	81,355,116	51,347,892	2,042,565	12,579,602	40,653,254	21,505,271	85,637,995
	1955	78,392,886	48,508,177	2,104,441	11,788,886	39,671,902	21,796,703	86,400,170
Elgin, Joliet & Eastern	1956	53,517,901	36,291,796	493,278	14,935,112	22,711,919	20,531,835	14,661,000
	1955	50,402,793	30,585,169	550,386	6,953,338	21,021,740	20,189,962	16,146,800
Erie	1956	175,899,859	137,693,502	4,917,366	7,892,354	47,053,002	31,425,028	217,560,832
	1955	161,447,842	128,046,722	4,998,195	6,378,652	43,337,235**	27,960,913	217,545,073
Fonda, Johnstown & Gloversville	1956	421,810	424,142	.....	6,099	201,386	146,012	587,175
	1955	604,497	677,676	5,429	29,745d	296,803	251,727	593,225
Illinois Central	1956	298,418,524	222,527,827	7,347,276	23,759,206	110,193,610	60,401,184	198,384,000
	1955	294,525,300	213,306,758	7,501,759	26,542,044	113,174,104	59,946,604	193,136,000
Indianapolis Union	1956	#	#	167,961	304,592	2,147,876	1,087,848	4,687,000
	1955	#	#	175,451	297,785	1,850,104	1,051,898	4,765,000
Lake Superior & Ishpeming	1956	5,437,596	3,578,319	25,333	1,216,320	4,007,025	1,414,763	688,050
	1955	5,935,044	3,382,708	29,086	1,490,058	4,155,852	1,679,650	813,150
Lehigh & New England	1956	8,315,594	6,656,598	220,859	2,438,107	2,893,852	1,502,354	7,546,616
	1955	7,549,236	5,979,237	205,290	1,952,426	3,493,813	1,600,870	6,771,876
Lehigh Valley	1956	71,580,668	58,206,299	2,490,394	4,213,438	19,051,804	8,689,286	79,813,097
	1955	68,911,232	55,888,473	2,730,100	5,599,212	18,521,556	9,494,701	81,244,616
Long Island	1956	64,521,707	55,529,176	1,423,164	815,558	14,290,259	11,063,864	96,155,835
	1955	61,049,197	52,224,662	1,020,465	636,323	15,567,735	12,194,973	90,807,174
Maine Central	1956	27,393,729	21,190,445	1,408,897	1,367,412	8,913,120	5,581,328	29,352,411
	1955	24,890,572	19,321,762	1,348,966	1,113,809	8,054,868	5,235,163	27,392,282
Mississippi Central	1956	2,421,039	1,865,701	57,584	173,095	804,299	293,054	1,291,809
	1955	2,486,154	1,809,598	66,259	213,662	882,923	322,785	1,498,909
Missouri Pacific	1956	304,506,950	232,157,957	14,689,379	19,593,284	93,870,117	60,482,350	587,605,152
	1955	300,077,947	232,332,611	15,637,977	14,595,039	125,487,328	63,173,996	623,930,429
Monongahela	1956	6,454,004	3,962,498	511,792	332,262	1,128,797	1,018,640	10,256,520
	1955	5,529,791	3,516,402	528,166	4,814d	1,080,162	1,194,363	10,792,671
New York, Susquehanna & Western	1956	5,311,857	4,258,435	185,234	194,339d	2,509,755	2,472,865	8,481,706
	1955	5,665,169	4,304,801	195,171	131,161d	3,599,181	3,396,736	8,964,155
Pennsylvania System	1956	992,363,535	818,241,978	40,149,702	52,519,888	275,626,446	153,251,747	962,144,082
	1955	936,098,340	769,900,260	40,794,331	50,208,856	285,290,742	149,972,924	987,468,639
Peoria & Pekin Union	1956	2,952,715	2,272,009	62,016	256,998	1,765,557	1,067,075	1,924,746
	1955	2,867,224	2,077,017	63,960	300,169	2,202,507	1,084,376	2,004,242
Pittsburgh & Lake Erie	1956	42,168,119	33,979,112	729,806	9,902,131	34,808,052	15,671,196	29,119,000
	1955	41,301,062	31,703,477	795,146	11,805,027	26,809,090	12,371,019	24,742,000
Reading	1956	138,280,376	105,751,540	5,620,350	12,112,831	38,399,499	26,794,251	135,129,337
	1955	119,622,974	92,371,989	5,532,374	10,896,718	39,910,904	24,001,992	130,270,309
Savannah & Atlanta	1956	3,892,794	2,657,246	152,005	537,007	1,540,992	1,164,892	3,186,092
	1955	3,579,122	2,338,501	100,273	483,173	1,979,056	1,313,986	2,029,679
Seaboard Air Line	1956	162,150,917	120,449,798	3,939,475	20,145,391	52,296,677	27,752,322	115,449,000
	1955	154,164,995	111,265,102	3,783,103	21,538,121	56,998,589	27,607,060	112,858,000
Southern	1956	275,385,491	188,863,555	12,608,703	38,871,606	88,279,270	73,794,589	214,632,716
	1955	276,913,414	181,029,631	13,357,969	37,993,249	138,773,391	79,482,164	271,809,565
Southern Pacific Transportation System	1956	678,325,181	548,494,986	22,300,515	46,461,927	209,595,129	114,690,171	725,598,284
	1955	666,919,863	529,108,191	21,108,016	51,644,703	202,790,572	107,687,721	656,532,848
Union Pacific	1956	514,316,827	376,254,723	5,552,389	78,568,845	242,787,617	121,662,661	167,084,000
	1955	509,362,476	370,526,330	5,795,036	79,227,255	234,319,713	129,779,597	178,443,007
Western Maryland	1956	52,444,711	36,377,027	2,802,361	8,241,408	17,273,350	13,356,906	78,340,992
	1955	47,425,936	31,941,412	2,523,197	8,224,636	17,289,726	11,913,025	76,448,555

①To be supplemented as reports from other roads are received.
* On December 31.
†Restated.
d Deficit.
** Revised.
#Absorbed by joint facility account.

Freight Operating Statistics of Large Railways—Selected Items

Region, Road and Year		Miles of road operated	Locomotive-Miles: Train-miles	Locomotive-Miles: Principal and helper	Locomotive-Miles: Light	Car-Miles: Loaded (*thousands*)	Car-Miles: Per cent loaded	Ton-miles (*thousands*: Gross excl. locos & tenders	Ton-miles (*thousands*: Net rev. and non-rev.	Road-locos. on lines: Serviceable: Unstored	Road-locos. on lines: Serviceable: Stored	Road-locos. on lines: B.O.	Road-locos. on lines: Per cent B.O.
New Eng. Region	Boston & Maine	1957	1,560	253,324	260,173	11,900	9,279	65.0	623,655	254,227	71	..	..	..
		1956	1,562	259,518	266,376	12,296	10,189	64.9	676,221	269,725	64	..	3	4.5
	N. Y., N. H. & Htfd.	1957	1,739	256,938	256,944	19,863	10,608	65.7	676,349	266,590	84	..	11	11.6
		1956	1,746	283,637	283,657	15,645	11,711	67.1	730,335	295,443	89	..	22	19.8
Great Lakes Region	Delaware & Hudson	1957	771	179,633	185,014	6,982	9,440	69.5	673,876	365,666	40	..	2	4.8
		1956	792	189,894	195,938	7,816	10,505	69.5	733,579	384,922	31	4	4	10.3
	Del., Lack. & Western	1957	962	291,854	305,631	28,069	12,413	67.9	824,852	360,875	65	..	..	..
		1956	962	310,750	327,329	28,346	12,734	67.7	843,531	369,017	61	..	1	1.6
	Erie	1957	2,207	593,674	601,660	18,996	30,945	68.0	1,947,636	785,548	169	..	2	1.2
		1956	2,225	580,684	587,080	19,540	31,689	67.9	1,970,380	793,092	162	..	3	1.8
	Grand Trunk Western	1957	951	263,884	271,744	2,291	8,456	60.3	603,857	243,421	50	1	16	23.9
		1956	951	301,272	307,438	2,365	9,173	59.5	675,594	281,292	56	..	17	23.3
	Lehigh Valley	1957	1,134	224,845	228,382	10,911	9,865	64.9	682,496	311,062	33	..	1	2.9
		1956	1,137	216,484	220,685	10,231	10,616	67.2	721,412	335,629	34	..	1	2.9
	New York Central	1957	10,565	2,316,291	2,338,363	98,772	91,728	59.1	6,696,725	2,943,697	548	3	43	7.2
		1956	10,661	2,681,753	2,728,567	127,783	103,884	58.8	7,653,335	3,350,711	603	4	82	11.9
	New York, Chic. & St. L.	1957	2,155	734,385	749,328	8,626	29,867	64.5	2,118,024	936,970	174	..	20	10.3
		1956	2,154	757,026	777,792	8,201	31,273	64.1	2,204,081	974,440	177	1	17	8.7
	Pitts. & Lake Erie	1957	221	70,053	70,107	....	2,789	63.1	242,474	145,178	12	..	1	7.7
		1956	221	70,920	71,328	....	2,936	61.9	257,089	152,820	14	..	..	..
	Wabash	1957	2,379	523,949	523,949	6,214	22,465	64.6	1,497,715	589,525	110	..	3	2.7
		1956	2,381	531,737	533,332	6,088	23,509	65.5	1,548,815	611,601	103	..	2	1.9
Central Eastern Region	Baltimore & Ohio	1957	5,897	1,651,482	1,835,988	157,311	65,786	61.0	5,065,386	2,410,787	470	13	89	15.6
		1956	5,910	1,721,832	1,916,433	172,595	64,120	58.8	5,337,025	2,546,464	447	2	83	15.6
	Bessemer & Lake Erie	1957	208	34,298	35,331	31	1,136	67.7	114,889	72,079	13	1	..	..
		1956	208	40,584	40,853	56	1,510	63.9	156,592	96,507	13	3	..	..
	Central RR Co. of New Jersey	1957	612	133,003	134,015	6,685	4,762	62.8	374,548	196,629	65	..	5	7.1
		1956	613	129,399	130,255	6,294	5,123	66.7	387,814	208,181	63	..	3	4.5
	Chicago & Eastern Ill.	1957	862	125,812	125,812	3,142	5,526	63.6	410,132	198,356	28	..	3	9.7
		1956	868	139,041	139,041	3,278	5,772	62.9	437,514	215,640	28	..	2	6.6
	Elgin, Joliet & Eastern	1957	236	93,143	94,075	....	2,740	60.0	228,040	119,875	37	..	3	7.5
		1956	236	95,225	95,589	48	2,996	63.2	244,766	132,446	35	..	5	12.5
	Pennsylvania System	1957	9,902	3,047,871	3,230,007	225,584	118,208	62.9	8,734,355	4,027,291	861	21	187	17.5
		1956	9,892	3,016,340	3,202,665	234,121	124,576	63.8	8,949,410	4,109,081	790	46	407	32.7
	Reading	1957	1,303	383,073	386,427	14,676	14,366	60.6	1,216,391	650,618	171	2	21	10.8
		1956	1,305	388,141	391,731	14,700	15,248	61.9	1,243,166	697,664	163	..	29	15.1
	Western Maryland	1957	846	178,653	185,331	10,262	6,959	59.3	617,403	344,861	44	..	..	..
		1956	846	179,400	188,623	12,578	7,273	61.0	628,507	352,827	35	..	..	..
Pocahontas Region	Chesapeake & Ohio	1957	5,067	1,455,927	1,461,581	26,986	59,738	55.9	5,327,623	2,927,639	594	7	77	11.4
		1956	5,067	1,621,402	1,651,957	56,103	64,980	56.0	5,735,153	3,158,127	450	2	112	19.9
	Norfolk & Western	1957	2,110	775,264	836,060	68,951	36,965	56.7	3,547,646	1,948,120	214	1	20	8.5
		1956	2,103	804,167	870,088	81,612	37,114	57.6	3,527,775	1,943,905	230	3	25	9.7
Southern Region	Atlantic Coast Line	1957	5,283	858,034	858,034	10,431	25,903	58.5	1,948,795	852,014	136	..	4	2.9
		1956	5,278	902,201	902,207	10,069	28,863	58.8	2,183,528	969,152	229	..	7	3.0
	Central of Georgia	1957	1,731	196,494	196,494	1,922	7,742	67.5	545,047	263,135	33	..	2	5.7
		1956	1,731	198,107	198,132	1,771	8,023	68.7	555,126	271,016	33	..	1	2.9
	Gulf, Mobile & Ohio	1957	2,717	275,553	275,553	364	15,170	68.8	1,045,622	502,027	85	..	6	6.6
		1956	2,717	278,941	278,941	342	16,116	68.0	1,120,946	538,027	85	..	6	6.6
	Illinois Central	1957	6,503	1,190,680	1,190,823	32,987	48,712	62.3	3,582,244	1,672,089	308	11	69	17.8
		1956	6,531	1,255,160	1,256,890	37,596	51,159	62.4	3,782,943	1,778,687	362	5	154	29.5
	Louisville & Nashville	1957	4,713	898,864	901,173	15,131	32,924	62.1	2,516,693	1,292,304	142	..	4	2.7
		1956	4,714	949,453	956,730	20,221	34,914	62.1	2,647,840	1,355,164	192	1	25	11.5
	Nash., Chatt. & St. Louis	1957	1,043	164,524	167,765	3,498	5,430	69.0	353,736	162,011	40	..	3	7.0
		1956	1,043	178,080	181,896	4,193	5,855	71.0	383,963	180,754	51	..	2	3.8
	Seaboard Air Line	1957	4,051	704,793	704,793	3,343	26,735	62.3	1,959,420	878,584	153	..	7	4.4
		1956	4,051	685,951	685,951	2,830	27,963	64.4	2,033,646	938,057	141	..	12	7.8
	Southern	1957	6,251	881,841	881,901	10,544	41,235	65.4	2,780,123	1,278,321	189	10	6	2.9
		1956	6,259	937,765	937,825	13,595	45,018	66.8	2,974,941	1,369,071	280	..	3	1.1
Northwestern Region	Chicago & North Western	1957	9,296	815,225	816,233	9,945	30,564	64.7	2,176,826	916,890	164	6	5	2.9
		1956	9,344	846,336	849,757	14,078	35,699	66.0	2,434,769	1,080,008	196	15	51	19.5
	Chicago Great Western	1957	1,437	135,412	135,412	200	7,185	69.2	488,225	228,496	31	..	1	3.1
		1956	1,437	137,159	137,159	192	8,180	70.2	543,005	251,945	28	..	5	15.2
	Chic., Milw., St. P. & Pac.	1957	10,621	893,419	905,843	18,453	37,653	63.1	2,623,477	1,163,136	281	1	19	6.3
		1956	10,633	965,939	981,171	18,793	41,655	63.1	2,888,213	1,269,549	271	7	14	4.8
	Chic., St. P., Minn. & Omaha	1957	566	35,900	35,939	448	724	48.7	62,070	28,804	19	32	22	30.1
		1956	570	33,264	33,592	703	590	49.1	47,520	20,302	30	24	17	23.9
	Duluth, Missabe & Iron Range	1957	8,273	1,095,268	1,098,957	32,562	37,788	70.4	2,625,491	1,256,886	228	74	39	11.4
		1956	8,273	1,129,272	1,135,953	33,709	41,440	70.2	2,864,689	1,368,355	244	83	53	13.9
	Great Northern	1957	4,169	380,635	382,114	1,479	12,114	65.5	893,402	388,260	84	5	4	4.3
		1956	4,171	389,713	392,667	2,648	13,155	64.8	919,857	412,418	82	11	2	2.1
	Minneap., St. P. & S. Ste. M.	1957	6,536	810,236	826,815	20,608	30,615	65.1	2,145,313	965,059	222	57	26	8.5
		1956	6,569	863,371	879,774	24,613	33,945	66.2	2,338,142	1,054,184	243	49	54	15.6
	Northern Pacific	1957	944	140,474	140,474	1,312	5,391	69.0	378,425	179,649	53	..	1	1.9
		1956	946	149,204	151,252	1,366	6,227	68.7	435,565	203,911	56	..	8	12.5
Central Western Region	Atch., Top. & S. Fe (incl. G. C. & S. F. and P. & S. F.)	1957	13,172	2,408,554	2,525,871	44,792	108,419	61.8	7,608,986	2,843,918	556	48	63	9.4
		1956	13,124	2,459,407	2,573,509	62,818	109,883	64.5	7,494,574	2,886,192	526	81	37	5.7
	Chic., Burl. & Quincy	1957	8,765	1,037,184	1,031,922	26,679	44,557	65.7	3,033,594	1,332,361	153	42	29	12.9
		1956	8,772	1,064,909	1,057,901	27,786	47,814	66.1	3,218,556	1,401,423	207	28	46	16.4
	Chic., Rock I. & Pac.	1957	7,581	964,690	968,029	1,391	37,131	61.9	2,673,705	1,101,621	170	..	5	2.9
		1956	7,580	922,513	923,691	1,608	37,158	60.9	2,680,501	1,078,611	171	..	4	2.3
	Denver & R. G. Wn.	1957	2,155	283,201	303,163	31,321	13,405	70.3	954,813	472,726	73	8	6	6.9
		1956	2,155	286,893	306,525	29,106	13,493	67.8	950,337	454,790	64	8	28	28.0
	Southern Pacific	1957	8,038	1,858,774	1,938,187	90,942	86,736	65.0	5,923,253	2,483,812	591	124	57	7.4
		1956	8,066	2,080,905	2,186,148	177,770	93,831	65.0	6,384,916	2,657,718	598	66	94	12.4
	Union Pacific	1957	9,786	2,183,749	2,237,909	89,625	95,688	62.2	6,728,057	2,829,446	405	63	101	17.8
		1956	9,805	2,292,031	2,339,237	108,088	102,678	64.3	6,970,586	2,928,051	403	79	138	22.3
	Western Pacific	1957	1,190	210,209	226,288	10,535	9,262	70.1	608,876	275,263	47	..	1	2.1
		1956	1,190	219,917	227,640	17,290	9,266	68.2	639,508	296,256	43	..	1	2.3
Southwestern Region	Kansas City Southern	1957	886	150,914	150,945	301	8,912	68.3	647,334	303,985	27	..	1	3.6
		1956	886	156,105	156,156	312	8,630	68.3	618,938	286,278	25	..	2	7.4
	Louisiana & Arkansas	1957	746	95,200	95,200	9	4,238	64.3	329,842	155,659	19	..	..	..
		1956	753	108,456	108,456	102	4,510	64.6	346,803	161,973	18	..	..	..
	Mo.-Kans.-Texas Lines	1957	3,172	383,366	383,366	4,024	15,182	63.6	1,024,445	372,146	80	..	..	..
		1956	3,230	325,909	325,909	3,550	14,691	65.7	956,169	402,204	86	..	..	..
	Missouri Pacific	1957	9,662	1,232,834	1,232,834	9,949	55,565	62.9	3,955,595	1,734,464	327	..	48	12.8
		1956	9,709	1,297,756	1,297,756	10,647	56,857	63.7	4,027,058	1,744,064	324	17	41	10.7
	Texas & Pacific	1957	1,822	318,131	318,131	5,700	16,123	61.8	1,199,831	458,071	46	..	1	2.1
		1956	1,822	341,634	341,634	4,276	16,170	61.5	1,188,600	444,769	62	..	1	1.6
	St. Louis-San Francisco	1957	4,573	621,129	621,129	5,959	24,101	66.4	1,625,074	734,832	95	..	12	11.2
		1956	4,573	608,791	609,176	5,723	25,215	66.9	1,671,525	749,114	104	..	6	5.5
	St. Louis Southw. Lines	1957	1,554	345,307	345,329	1,654	16,118	65.9	1,053,325	470,851	52	..	1	1.9
		1956	1,554	345,107	345,129	1,611	17,135	70.1	1,073,779	479,994	54	..	2	3.6
	Texas & New Orleans	1957	4,285	656,426	656,426	799	27,818	62.6	1,989,605	851,163	135	..	1	.7
		1956	4,302	697,646	697,646	3,249	29,012	66.5	1,999,116	878,433	132	..	7	5.0

For the month of January 1957 Compared with January 1956

Region, Road and Year	Freight cars on line: Home	Foreign	Total	Per Cent B.O.	G.t.m.per train-hr. excl.locos and tenders	G.t.m.per train-mi. excl.locos. and tenders	Net ton-mi. per train-mile	Net ton-mi. per l'd car-mile	Net ton-mi. per car-day	Car-miles per car-day	Net daily ton-mi. per road-mi.	Train-miles per train-hour	Mi es per loco. per day
New Eng. Region													
Boston & Maine 1957	1,346	9,364	10,710	1.7	35,721	2,471	1,007	27.4	780	43.8	5,257	14.5	141.7
1956	1,698	9,053	10,751	4.7	40,867	2,613	1,042	26.5	802	46.7	5,570	15.7	151.5
N. Y., N. H. & Htfd. 1957	2,331	13,686	16,017	3.0	41,216	2,632	1,038	25.1	533	32.2	4,945	15.7	117.1
1956	2,141	18,002	20,143	2.0	41,379	2,575	1,042	25.2	476	28.1	5,458	16.1	111.0
Great Lakes Region													
Delaware & Hudson 1957	2,019	7,038	9,057	4.4	61,056	3,770	2,046	38.7	1,264	47.0	15,299	16.3	161.9
1956	2,059	5,502	7,561	4.7	68,540	3,880	2,036	36.6	1,623	63.7	15,678	17.7	178.3
Del., Lack. & Western 1957	4,186	13,476	17,662	2.5	49,714	2,867	1,254	29.1	677	34.3	12,101	17.6	181.0
1956	4,172	11,807	15,979	2.8	48,125	2,750	1,203	29.0	716	36.5	12,374	17.7	199.2
Erie 1957	5,982	21,359	27,341	2.6	65,267	3,306	1,333	25.4	908	52.6	11,482	19.9	129.9
1956	7,113	19,675	26,788	3.7	64,584	3,425	1,378	25.0	942	55.4	11,498	19.0	133.1
Grand Trunk Western 1957	4,101	9,472	13,573	6.4	47,399	2,308	930	28.8	584	33.7	8,257	20.7	134.4
1956	4,043	10,266	14,309	6.8	50,089	2,266	943	30.7	628	34.4	9,541	22.3	144.0
Lehigh Valley 1957	4,216	9,704	13,920	5.0	67,162	3,066	1,397	31.5	713	34.9	8,849	22.1	244.8
1956	8,193	7,792	15,985	5.9	70,251	3,365	1,565	31.6	668	31.5	9,522	21.1	238.2
New York Central 1957	48,446	87,615	136,061	2.7	47,465	2,942	1,293	32.1	669	35.3	8,988	16.4	154.6
1956	52,692	100,970	153,662	3.4	49,553	2,897	1,268	32.3	703	37.0	10,139	17.4	153.6
New York, Chic. & St. L. 1957	8,012	17,588	25,600	6.1	50,572	2,943	1,302	31.4	1,250	61.7	14,025	17.5	138.8
1956	7,365	18,206	25,571	5.8	50,905	2,971	1,314	31.2	1,237	61.9	14,593	17.5	142.5
Pitts. & Lake Erie 1957	3,643	8,738	12,381	6.2	50,170	3,471	2,078	52.1	384	11.7	21,191	14.5	177.1
1956	2,937	9,188	12,125	5.4	53,717	3,643	2,165	52.1	435	13.5	22,306	14.8	167.2
Wabash 1957	8,703	11,236	19,939	3.5	61,974	2,870	1,130	26.2	951	56.1	7,994	21.7	160.8
1956	8,915	9,390	18,305	4.3	63,848	2,924	1,155	26.0	1,046	61.4	8,286	21.9	176.0
Central Eastern Region													
Baltimore & Ohio 1957	44,286	57,655	101,941	3.1	47,434	3,124	1,487	36.6	775	34.6	13,188	15.5	117.8
1956	42,193	50,470	92,663	6.0	47,960	3,149	1,503	39.7	892	38.2	13,899	15.5	132.0
Bessemer & Lake Erie 1957	3,895	864	4,759	12.8	54,735	3,556	2,231	63.4	442	10.3	11,179	16.3	97.4
1956	3,698	1,054	4,752	21.7	65,492	4,054	2,498	63.9	703	17.2	14,967	17.0	95.1
Central RR Co. of New Jersey 1957	2,195	10,790	12,985	6.6	43,386	2,962	1,555	41.3	486	18.7	10,364	15.4	88.6
1956	2,448	10,906	13,354	6.6	44,301	3,125	1,677	40.6	522	19.3	10,955	14.8	92.7
Chicago & Eastern Ill. 1957	2,041	4,182	6,223	9.4	57,177	3,280	1,586	35.9	1,000	43.8	7,423	17.5	140.8
1956	2,368	3,602	5,970	7.8	56,027	3,160	1,557	37.4	1,147	48.8	8,014	17.8	160.1
Elgin, Joliet & Eastern 1957	7,071	13,102	20,173	5.9	18,602	2,577	1,355	43.8	199	7.6	16,385	7.6	100.2
1956	6,727	11,021	17,748	5.1	22,929	2,710	1,467	44.2	247	8.8	18,104	8.9	100.8
Pennsylvania System 1957	107,067	89,078	196,145	7.4	49,387	2,945	1,358	34.1	662	30.9	13,120	17.2	114.9
1956	95,930	96,527	192,457	8.0	52,049	3,046	1,399	33.0	685	32.5	13,400	17.5	97.4
Reading 1957	11,473	26,037	37,510	2.2	49,255	3,175	1,698	45.3	565	20.6	16,107	15.5	80.7
1956	11,632	24,165	35,797	3.5	48,799	3,203	1,798	45.8	652	23.0	17,245	15.2	80.5
Western Maryland 1957	5,208	4,369	9,577	2.4	49,932	3,527	1,970	49.6	1,152	39.2	13,150	14.4	146.9
1956	4,795	6,154	10,949	2.3	46,508	3,586	2,013	48.5	1,089	36.8	13,453	13.3	203.3
Pocahontas Region													
Chesapeake & Ohio 1957	51,444	29,375	80,819	.7	67,953	3,679	2,022	49.0	1,179	43.1	18,638	18.6	76.7
1956	45,124	30,275	75,399	1.3	66,852	3,562	1,962	48.6	1,343	49.3	20,106	18.9	102.9
Norfolk & Western 1957	38,053	10,680	48,733	1.4	79,678	4,705	2,584	52.7	1,263	42.3	29,783	17.4	134.8
1956	32,937	11,108	44,045	1.6	73,119	4,513	2,487	52.4	1,442	47.8	29,818	16.7	129.8
Southern Region													
Atlantic Coast Line 1957	19,273	18,511	37,784	4.4	43,248	2,282	998	32.9	734	38.1	5,202	19.0	216.6
1956	18,316	19,005	37,321	4.4	45,294	2,431	1,079	33.6	851	43.1	5,923	18.7	137.6
Central of Georgia 1957	2,443	6,479	8,922	2.7	49,694	2,778	1,341	34.0	1,003	43.7	4,904	17.9	121.4
1956	2,420	6,901	9,321	3.5	48,966	2,808	1,371	33.8	951	41.0	5,051	17.5	126.7
Gulf, Mobile & Ohio 1957	5,176	10,241	15,417	6.9	73,506	3,796	1,823	33.1	1,044	45.8	5,960	19.4	106.1
1956	5,035	11,058	16,093	2.9	76,840	4,025	1,932	33.4	1,056	46.5	6,388	19.1	107.1
Illinois Central 1957	24,481	26,119	50,600	1.9	51,695	3,050	1,424	34.3	1,052	49.2	8,295	17.2	109.9
1956	23,792	27,129	50,921	2.3	49,764	3,059	1,438	34.8	1,106	51.0	8,785	16.5	90.0
Louisville & Nashville 1957	28,003	14,412	42,415	4.1	50,338	2,807	1,441	39.2	981	40.2	8,844	18.0	188.1
1956	26,938	15,404	42,342	3.0	49,131	2,796	1,431	38.8	1,038	43.1	9,273	17.6	158.9
Nash., Chatt. & St. Louis 1957	2,929	4,657	7,586	5.5	44,406	2,154	987	29.8	692	33.6	5,011	20.7	125.8
1956	3,351	3,135	6,486	5.2	42,954	2,159	1,017	30.9	909	41.5	5,590	19.9	124.0
Seaboard Air Line 1957	12,452	17,155	29,607	2.2	52,692	2,833	1,270	32.9	940	45.9	6,996	19.0	171.9
1956	12,484	17,174	29,658	2.6	55,658	3,033	1,399	33.5	1,036	48.0	7,470	18.8	172.4
Southern 1957	16,865	25,371	42,236	4.1	53,382	3,164	1,455	31.0	1,022	50.4	6,597	16.9	153.4
1956	14,745	25,917	40,662	3.0	54,772	3,185	1,466	30.4	1,078	53.1	7,056	17.3	119.4
Northwestern Region													
Chicago & North Western 1957	18,204	31,492	49,696	5.0	45,615	2,706	1,140	30.0	599	30.9	3,182	17.1	165.4
1956	16,584	38,189	54,773	5.0	49,859	2,923	1,297	30.3	657	32.9	3,728	17.3	117.0
Chicago Great Western 1957	1,659	4,834	6,493	3.0	68,131	3,612	1,690	31.8	1,232	56.0	5,129	18.9	142.8
1956	1,562	4,002	5,564	3.6	74,394	3,968	1,841	30.8	1,438	66.5	5,656	18.8	139.9
Chic., Milw., St. P. & Pac. 1957	29,346	30,800	60,146	6.4	56,289	2,945	1,306	30.9	626	32.1	3,533	19.2	107.7
1956	29,945	32,081	62,026	6.0	56,452	2,998	1,318	30.5	663	34.5	3,852	18.9	119.9
Chic., St. P., Minn. & Omaha 1957	12,832	840	13,672	2.8	26,708	1,805	838	39.8	67	3.5	1,642	15.4[a]	19.7
1956	13,405	788	14,193	2.1	21,649	1,513	647	34.4	45	2.7	1,149	15.2[a]	19.2
Duluth, Missabe & Iron Range 1957	21,305	18,368	39,673	3.5	50,203	2,422	1,160	33.3	1,010	43.1	4,901	20.9[a]	113.5
1956	21,477	21,471	42,948	2.9	50,876	2,564	1,225	33.0	1,020	44.0	5,335	20.1[a]	107.2
Great Northern 1957	5,662	8,456	14,118	5.3	49,346	2,358	1,025	32.1	840	40.0	3,004	21.0[a]	152.4
1956	5,990	8,814	14,804	5.6	49,004	2,375	1,065	31.4	891	43.8	3,190	20.8[a]	153.2
Minneap., St. P. & S. Ste. M. 1957	18,647	16,700	35,347	3.9	52,099	2,656	1,195	31.5	859	41.8	4,763	19.7[a]	95.9
1956	18,684	19,377	38,061	5.4	53,663	2,718	1,225	31.1	895	43.6	5,177	19.8[a]	89.4
Northern Pacific 1957	1,342	4,693	6,035	1.6	38,933	2,716	1,289	33.3	981	42.7	6,139	14.5[a]	93.6
1956	1,252	4,726	5,978	2.9	40,964	2,940	1,376	32.7	1,193	53.0	6,953	14.0	95.3
Central Western Region													
Atch., Top. & S. Fe (incl. G. C. & S. F. and P. & S. F.) 1957	58,630	35,763	94,393	4.4	76,351	3,162	1,182	26.2	981	60.5	6,965	24.2	131.9
1956	49,591	32,128	81,719	3.6	73,288	3,060	1,178	26.3	1,104	65.2	7,094	24.1	140.0
Chic., Burl. & Quincy 1957	20,596	21,136	41,732	3.3	63,330	2,929	1,286	29.9	1,032	52.5	4,904	21.7	162.7
1956	20,261	23,366	43,627	3.9	64,434	3,028	1,318	29.3	1,026	53.0	5,154	21.3	124.2
Chic., Rock I. & Pac. 1957	12,001	21,221	33,222	6.3	58,266	2,776	1,144	29.7	1,050	57.2	4,688	21.0	187.0
1956	11,838	19,109	30,947	4.6	59,432	2,911	1,171	29.0	1,097	62.1	4,590	20.5	178.2
Denver & R. G. Wn. 1957	6,963	6,351	13,314	3.7	61,474	3,382	1,674	35.3	1,110	44.8	7,076	18.2	133.4
1956	7,724	6,481	14,205	2.9	62,085	3,324	1,591	33.7	1,024	44.9	6,808	18.7	114.5
Southern Pacific 1957	29,861	34,855	64,716	1.8	65,947	3,231	1,355	28.6	1,238	66.5	9,968	20.7	91.2
1956	31,410	39,021	70,431	1.9	59,935	3,103	1,291	28.3	1,131	61.5	10,629	19.5	109.2
Union Pacific 1957	30,942	32,626	63,568	1.9	77,678	3,112	1,309	29.6	1,428	77.7	9,327	25.2	140.2
1956	28,276	33,400	61,676	1.8	77,226	3,080	1,294	28.5	1,486	81.1	9,633	25.4	129.0
Western Pacific 1957	2,344	3,066	5,410	2.2	69,277	2,923	1,321	29.7	1,630	78.2	7,462	23.9	168.7
1956	2,337	5,187	7,524	1.0	67,338	2,939	1,361	32.0	1,245	57.1	8,031	23.2	182.4
Southwestern Region													
Kansas City Southern 1957	1,765	5,704	7,469	4.3	89,214	4,325	2,031	34.1	1,313	56.4	11,068	20.8	211.7
1956	894	6,270	7,164	1.1	83,844	3,992	1,847	33.2	1,267	55.9	10,423	21.1	217.1
Louisiana & Arkansas 1957	1,613	3,633	5,246	6.5	70,314	3,472	1,639	36.7	968	41.0	6,731	20.3	222.2
1956	1,296	4,197	5,493	3.8	64,342	3,209	1,499	35.9	963	41.5	6,939	20.1	235.4
Mo.-Kans.-Texas Lines 1957	4,486	7,090	11,576	5.8	59,609	2,684	975	24.5	1,055	67.7	3,785	22.3	163.5
1956	4,005	7,978	11,983	6.7	62,332	2,944	1,238	27.4	1,166	64.8	4,018	21.2	132.2
Missouri Pacific 1957	19,240	26,796	46,036	1.9	68,092	3,221	1,412	31.2	1,233	62.7	5,791	21.2	115.9
1956	71,885	29,127	51,012	3.0	69,335	3,135	1,358	30.7	1,117	57.2	5,795	22.3	118.9
Texas & Pacific 1957	3,092	6,249	9,341	3.3	79,712	3,783	1,444	28.4	1,544	87.9	8,110	21.1	240.7
1956	2,773	6,683	9,456	2.0	77,157	3,487	1,305	27.5	1,491	88.1	7,875	22.2	190.6
St. Louis-San Francisco 1957	12,053	12,881	24,934	3.0	55,000	2,629	1,189	30.5	992	49.0	5,184	21.0	201.1
1956	13,074	12,476	25,550	2.8	56,930	2,751	1,233	29.7	996	50.1	5,284	20.7	190.1
St. Louis Southw. Lines 1957	2,109	4,553	6,662	1.4	68,393	3,055	1,366	29.2	2,329	121.0	9,774	22.4	220.1
1956	2,110	4,771	6,881	1.0	67,254	3,126	1,397	28.0	2,308	117.5	9,964	21.6	209.4
Texas & New Orleans 1957	5,399	15,273	20,672	1.4	64,301	3,052	1,305	30.6	1,302	68.0	6,408	21.2	156.5
1956	5,465	17,009	22,474	1.3	60,265	2,883	1,267	30.3	1,307	64.9	6,587	21.0	171.6

a Includes operations of Chicago, St. Paul, Minneapolis and Omaha Railway Co. under lease effective January 1, 1957.

Compiled by the Bureau of Transport Economics and Statistics, Interstate Commerce Commission. Subject to revision.

(Continued from page 15)
along the line will eventually understand that what we are trying to do is make Katy one of the strongest and best railroads in the country."

The letter listed several problems with which the railroad is faced: Most of its diesel locomotives need overhauling; 3,000,000 crossties need immediate replacement; large quantities of new rail are necessary; decentralized offices and shops are uneconomic; and the cash is inadequate.

"Major force reductions and the transfer or abolition of entire offices were necessary," Mr. Deramus said.

AAR Opposes Pending Brake Laws

Enactment of pending legislation requiring the Interstate Commerce Commission to prescribe rules for power or train brakes would "impose more regulation upon an already over-regulated industry."

The proposed legislation, Richard G. May, vice-president in charge of the Operations and Maintenance Department, Association of American Railroads, testified before a subcommittee of the House Interstate and Foreign Commerce Committee, "would establish unnecessary rigidity and require the expenditure of effort and money by the railroads that might better be spent on other matters that are of at least equal importance in railroad safety."

Terming the legislation "unnecessary" and "without justification," Mr. May went on to point out that the proposed bill could delay the adoption of new devices, improvement in present power operated brake systems, new methods of inspection and new methods of repairs.

He asserted that if this were to materialize "railroads would lose for long periods of time the benefits of much needed economies, improved efficiency and even greater safety."

As important as power brakes are in the railroad safety picture, Mr. May continued, of equal importance are automatic block signals, centralized traffic control, durable rails, ties, bridges and many other elements that combine to keep the railroads running.

The railroad officer said passage of the pending legislation would give the ICC jurisdiction over a legitimate field of managerial discretion where management has compelling motives for maintaining the highest degree of safety and efficiency.

In such an instance, he cautioned, railroad management would thereby be precluded from adopting brake safety procedures prompted by their need to improve safety without the necessity of long hearings and the attendant delays necessarily associated with administrative procedures.

This, Mr. May said, would prevent the exercise of initiative and acceptance of responsibility by management in an important area of operations.

At GE Progress Starts with Research

(Continued from page 36)

ture permits operating gear teeth at higher stresses, thus enabling the higher horsepower per axle found on today's locomotives to be transmitted by the same size gears.

Successful operation of a fleet of electric locomotives with sealed roller-type armature bearings to which no grease was added between overhauls, led to experiments in 1944 looking toward the same type of operation on diesel-electric locomotives. Such a grease was found and GE subsequently pioneered in standardizing this type of lubrication on railway-type motors. Now extended also to include auxiliary motors, this elimination of periodic greasing of bearings has overcome a difficult lubrication problem, minimizing, at the same time, bearing failures traceable to dirt in the grease. Less maintenance and increased reliability for motive power have resulted.

Electrification Ahead?

Today, with railroad attention turned to high speeds, high tonnages and high density traffic problems, engineers see growing interest in electrification. Already in service on the Virginian is the first production freight locomotive equipped with electronic tubes to convert readily available alternating current into direct current—allowing the use of highly developed, economically mass-produced direct-current locomotive components of the type used on diesel-electric locomotives. Built to run at freight-train speeds, 65 mph maximum permissible, this locomotive weighs 197 tons, produces continuous tractive effort of 79,500 lb at 15.75 mph, is designed for 3,340 hp but can be operated for short periods at as high as 5,000 hp, and is equipped with dynamic braking. The unit's 11,000-volt 25-cycle single phase a-c power is collected and converted to d-c by 12 ignitron rectifier tubes, each 1 ft in diameter. Thus, direct current is supplied to the locomotive's six traction motors.

There is, as GE's manager of transportation sales development, K. R. Ross, points out, ample evidence of how today's railroad leaders constantly put new ideas to work in the interest of progressive railroading. Mr. Ross likes the comment made once by Dr. Whitney, the first director of the research laboratory: "Discoveries and inventions are not terminals; they are fresh starting points from which one can climb to new knowledge." That aptly defines GE's research aims.

January Accidents

The ICC has made public its Bureau of Transport Economics and Statistics' preliminary summary of railroad accidents for January. The compilation, shown below, is subject to revision.

No comparison with January 1956 was made because of the change in accident reporting rules which became effective the first of this year.

	Month of January 1957
Number of train accidents*	388
Number of accidents resulting in casualties	40
Number of casualties in train, train-service and nontrain accidents:	
Trespassers:	
Killed	43
Injured	35
Passengers on trains:	
(a) In train accidents*	
Killed	..
Injured	3
(b) In train-service accidents	
Killed	1
Injured	130
Employees on duty:	
Killed	21
Injured	1,290
All other nontrespassers:**	
Killed	140
Injured	586
Total — all classes of persons:	
Killed	205
Injured	2,044

*Train accidents (mostly collisions and derailments) are distinguished from train-service accidents by the fact that the former caused damage of more than $750 to railway property in 1957. Only a minor part of the total accidents result in casualties to persons, as noted above.

**Casualties to "Other nontrespassers" happen chiefly at highway grade crossings. Total highway grade-crossing casualties *for all classes of persons, including both trespassers and nontrespassers*, were as follows:

Persons:	
Killed	138
Injured	455

20 Railroads Paid March Fines Totaling $12,800

Twenty railroads in March paid fines totaling $12,800, plus costs, on 148 counts involving violations of Safety Appliance, Hours of Service, Signal Inspection, Accident Reports, and Locomotive Inspection acts.

This was reported by the ICC, which also said the largest amount, $2,100 and costs, was paid by the Panhandle & Santa Fe for 21 violations of the Safety Appliance Acts. Next came payments, totaling $1,600 and costs, by the New York Central for 16 violations of the same acts.

Growing Truckers 'Feel Their Oats'

Awareness that truck companies have grown from "little" businesses into sizable organizations is being expressed these days by truckers themselves.

R. N. Reedy, director of Ryder System, Inc., told a recent transport conference at Syracuse University that the trend is to "larger carriers or, at least, carriers adopting a more sophisticated financial policy."

Behind this, he said, are the handicaps a small trucker must overcome in financing equipment and real estate and maintaining adequate working capital. He said that because of their limited resources smaller companies have had to finance "by piecemeal methods, on a one-truck or one-terminal basis."

On the other hand, he said, "acquisition of other carrier properties and operating rights has been mainly limited to the larger carriers who can resort to other than earned surplus for resources."

The trend, he noted, "is toward consolidation and absorption. As companies become larger, the operating and financial methods of the individual, small operator will become obsolete and they will find it difficult to operate profitably or to take advantage of the traffic potentialities."

Further demonstration of the trucker's recognition of his growth came in an address by American Trucking Associations President R. C. Williams to the Western Highway Institute at Phoenix April 8. He said railroads, having recognized the potential of truck transport, are trying to take over the trucking industry.

"They would like to haul [lost freight] on the rails," Mr. Williams stated, "but if they can't haul it on the rails they are now willing to haul it on trucks—just so long as they own and operate those trucks."

He commented that there is a movement for coordination of transport services but said that as the railroads interpret it this means "a virtual takeover of the trucking industry, perhaps even on railroad terms."

"For our own part," Mr. Williams asserted, "we in the trucking industry are willing to help set up whatever kind of service the public demands. We have grown as big and as important as we are as a result of that philosophy. But we are going to insist . . . that we will not accept a minor role. None of us is about to agree to being taken over by anyone."

Oakland Terminal Has Direct WP Connection

H. C. Munson, vice-president and general manager of the Western Pacific, is shown as he spoke at recent ceremonies marking completion of the Oakland Terminal's direct Union Street connection with the WP. Previously, the OT had connected with the WP over a Southern Pacific line.

Organizations

American Association of Passenger Traffic Officers.—A regular interim meeting will be held in Chicago April 24-25. Speakers will include President Edward G. Budd, Jr., the Budd Company; James C. Worthy, vice-president—public relations, Sears, Roebuck & Co.; and Col. R. J. Cox, Director of the Military Traffic Management Agency, Department of Defense.

Association of Interstate Commerce Commission Practitioners.—The 28th annual meeting will be held in the Conrad Hilton Hotel, Chicago, May 15-16. Speakers will be George Smathers, United States Senator from Florida, and Owen Clarke, chairman, Interstate Commerce Commission.

Eastern Association of Car Service Officers.—Next meeting will be held May 2-3 in the Morrison Hotel, Chicago.

Great Lakes Regional Advisory Board.—New president is George J. Bleibtrey, director of traffic, Motor Wheel Corporation, Lansing, Mich. Next meeting will be held in Charlevoix, Mich., June 27-28.

New York Railroad Club. — G. M. Magee, director of engineering research, Association of American Railroads, will speak on "Research—Maintenance of Way and Structures," at a dinner meeting in the Commodore Hotel, May 23.

Pacific Coast Shippers Advisory Board.—Newly elected officers are: General chairman, F. Z. Wakefield, western traffic manager, Great Lakes Carbon Corporation, Los Angeles; vice-general chairman, Edward Rutherford, district traffic manager, wine division, Schenley Industries, Fresno, Cal.; general secretary, Lloyd W. Gragg, traffic manager, Kaiser Gypsum Company, Oakland Cal.; chairman of the executive committee, George E. Vawter, traffic manager, Sunkist Raisin Growers of California, Fresno.

People in the News

AMERICAN REFRIGERATOR TRANSIT CO.—**Everett W. Hargrave,** assistant general superintendent of transportation, **Missouri Pacific,** St. Louis, appointed superintendent of transportation, ART, succeeding **J. C. Darwin,** deceased.

CANADIAN NATIONAL.—**Cyril A. Wood,** assistant general freight agent (rates), Western region, Winnipeg, Man., appointed general freight agent (rates) there, succeeding the late **G. N. McMillan. Mathew A. Peebles,** chief of tariff bureau, and **Harry G. Wortman,** chief clerk in general freight office, Winnipeg, promoted to assistant general freight agents (rates) at that point. **Glen F. Nichol,** freight traffic representative, Port Arthur, Ont., named chief of tariff bureau, Winnipeg. **Fred A. Hill,** supervisor of divisions, appointed chief of divisions bureau.

Robert H. Tivy, regional transportation engineer, Moncton, N.B., appointed assistant superintendent, New Glasgow, N.S., division. **D. M. Trotter,** operation assistant, appointed assistant chief of transportation, Montreal. **C. F. Allan,** superintendent station service and weighing, Montreal, appointed system supervisor station service and his former position abolished. **Ernest Holmes Gilliatt,** acting regional transportation engineer, Moncton, succeeds Mr. Tivy as regional transportation engineer there.

H. J. McCallum and **A. H. Morgan** appointed district passenger agents at Winnipeg and Saskatoon, respectively.

William Henry Cole, assistant supervisor, wage bureau, Moncton, appointed regional supervisor, wage bureau, at that point.

CANADIAN PACIFIC.—**W. F. H. Pafford,** road foreman of engines, Revelstoke, B.C., appointed assistant superintendent, Wilkie, Sask.

CHESAPEAKE & OHIO.—**9. F. Andrews,** assistant trainmaster, Raleigh, W.Va., appointed trainmaster, St. Albans, W.Va.

Edward E. Shoemaker, freight service representative, Atlanta, Ga., appointed general agent, Birmingham, Ala.

CHICAGO & NORTH WESTERN.—**William H. Huffman,** assistant engineer of maintenance, Chicago, appointed assistant chief engineer there, succeeding **P. V. Thelander,** who retired April 1. **Maurice S. Reid,** assistant engineer of maintenance, Chicago, appointed engineer of maintenance there, replacing **L. R. Lamport,** resigned.

DULUTH, SOUTH SHORE & ATLANTIC.—**J. T. Ryan** appointed general agent, Pittsburgh, Pa.

ERIE.—**Frederick M. Klitz,** freight traffic manager, Chicago, transferred to New York. **Herbert C. Well,** assistant freight traffic manager, Chicago, promoted to freight traffic manager there and is succeeded by **Leonard M. Schukei. Charles L. Smith** appointed assistant general freight agent, New York, succeeding **Charles P. Bell,** who replaces Mr. Schukei as general freight agent, Chicago.

GREAT NORTHERN.—**Emmett M. Brady,** traveling passenger agent, Los Angeles, appointed district passenger agent there, to succeed **Samuel L. Williams,** who retired April 1.

LOUISVILLE & NASHVILLE-PENNSYLVANIA.—Effective April 16, district passenger sales and service offices of these roads in Louisville, Ky., now in Room 283, Starks Building, will be in Room 101 Union Station, 10th and Broadway. **J. C. McCloy** is district passenger agent, L&N, and **Joseph A. Sladen,** district sales manager, PRR.

MISSOURI PACIFIC.—**F. E. Yockey,** assistant superintendent of maintenance of way equipment, St. Louis, appointed superintendent of maintenance of way equipment there, succeeding **H. S. Craine,** retired. **W. I. Stadter** named to succeed Mr. Yockey.

D. E. Walker, superintendent, Palestine and San Antonio division, appointed assistant general manager, Gulf district, with headquarters remaining at Palestine, Tex., succeeding **V. A. Gordon,** promoted (Railway Age, Apr. 8, p. 44). Mr. Walker's successor is **R. D. Morris,** superintendent, Omaha and Northern Kansas divisions, Falls City, Neb., who in turn is replaced by **L. V. Hobbs,** assistant superintendent, St. Louis Terminal division (west side of river), St. Louis. **G. C. Smith,** trainmaster, Monroe, La., named to succeed Mr. Hobbs, and in turn is succeeded by **J. D. Wallace,** assistant trainmaster, Lake Charles, La.

Franklin K. Massey, commercial agent, Eugene, Ore., promoted to general agent at that point, to succeed **Guy L. Harmon,** transferred to Chicago. **Harry D. Freivogel,** secretary to the vice-president, traffic, appointed general agent, Sacramento, Cal., replacing **J. C. Selover,** promoted (Railway Age, Apr. 8, p. 44). **Thomas S. Glass,** assistant general passenger agent, Memphis, Tenn., named general agent, freight department there.

PENNSYLVANIA.—**David S. Greer,** superintendent of freight stations, Northwestern region, Chicago, appointed manager of freight stations and motor service, Philadelphia.

Effective April 8, the general office of the PRR, previously in the Suburban Station Building, is at Six Penn Center Plaza, Philadelphia 4, Pa.

SOUTHERN PACIFIC.—**J. L. Harrison,** assistant terminal superintendent, appointed terminal superintendent, West Oakland, Cal., to succeed **I. O. Underhill,** promoted (Railway Age, Apr. 15, p. 44). **E. L. O'Donnell** named to replace Mr. Harrison.

OBITUARY

W. C. Hawes, 70, who retired in December 1955 as superintendent transportation, **Bessemer & Lake Erie,** died April 6 in Greenville (Pa.) hospital.

Fred W. Ruttger, 67, master mechanic, **Long Island,** Richmond Hill, N.Y., died April 11.

Edward H. Utley, 65, vice-president and comptroller of the **Chicago South Shore & South Bend,** died April 9 at Michigan City, Ind.

William D. Cornell, 85, retired district passenger agent of the **Chicago & Alton** (Gulf, Mobile & Ohio), died April 14 in Evanston Hospital, Evanston, Ill.

Henry T. Fleisher, assistant chief engineer, communications and signals, **Chicago & North Western** at Chicago, died recently.

Financial

Applications

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—To assume liability for $6,000,000 of equipment trust certificates, second and final installment of a proposed $9,000,000 issue, the whole of which would finance in part the acquisition of 1,150 freight cars at an estimated total cost of $11,273,225 (Railway Age, Jan. 28, p. 40). The certificates would mature in 30 semi-annual installments beginning August 1. They would be sold by competitive bids which would fix the interest rate.

CHICAGO, ROCK ISLAND & PACIFIC.—To assume liability for $3,000,000 of equipment trust certificates to finance in part the purchase of 10 1,750-hp diesel locomotives from Electro-Motive Division, General Motors Corporation at an estimated unit cost of $172,183, and 290 hopper cars from Pullman-Standard Car Manufacturing Company at $7,980. Estimated total cost of the equipment is $4,036,030. The certificates would mature in 30 semiannual installments of $100,000 each, beginning December 1, 1957. They would be sold by competitive bids which would fix the interest rate.

ILLINOIS CENTRAL.—To assume liability for $9,600,000 of equipment trust certificates to finance in part the construction of 2,000 box cars in its own shops. Estimated unit cost of the cars is $6,500, and the estimated total cost is $13,000,000. The certificates would mature in 30 semi-annual installments of $320,000 each beginning November 1. They would be sold by competitive bids which would fix the interest rate.

WESTERN MARYLAND.—To assume liability for $4,185,000 of 3¾% equipment trust certificates to finance in part the purchase of 7 1,750-hp diesel road-switching locomotives at $187,247 each from Electro-Motive Division, General Motors Corporation, 300 hopper cars at $9,871 from Bethlehem Steel Company, and 100 covered hopper cars at $9,764 from Greenville Steel Car Company. Estimated total cost of the equipment is $5,248,741. The certificates would mature in 15 annual installments of $279,000 each, beginning May 1, 1958. Subject to commission approval, they have been sold to Halsey, Stuart & Co. and 8 associates, who submitted the most favorable bid—99.26 with the 3¾% interest rate.

Supply Trade

Fred Garlock, chief engineer of the freight car designing division of **General American Transportation Corporation,** has retired. He has been succeeded by **Stuart H. Moyes,** supervisor of the engineering department, car maintenance division.

Farr Company has announced the following personnel additions and changes: **Fred Richardson,** field sales engineer, promoted to southern division sales manager at New Orleans; **Ken DeBaun,** sales engineer, promoted to eastern division sales manager at New York. **Ken Baker** is now sales engineer in charge of the Washington, D.C., office; **Andrew Gourley,** western division sales manager in Los Angeles; and **E. L. Williams,** advertising and sales promotion manager, at El Segundo, Cal.

Lewis L. May, Jr., has been appointed Gulf regional manager of the Industrial Division of **Gould-National Batteries, Inc.,** at Dallas, Tex. He formerly serviced battery sales for Gould in Texas and Louisiana.

OBITUARY

William D. Hickey, 69, retired vice-president of the **Magnus Metal Corporation,** died April 11 in St. Joseph's Hospital, Joliet, Ill.

ADVERTISERS

CLASSIFIED ADVERTISEMENTS

Rates: $10 per column inch (1" deep x 1⅝" wide)
Equipment used or resale acceptable in this section

Position Wanted

Canadian, age 32, married, seeks position anywhere with energetic railroad operation offering challenge and opportunities for advancement. Seven years extensive training in single track mountain operation under Standard Code acquired in Latin America. Recent administrative position on 130 mile road proves ability to accept responsibility. Address Box 827, Railway Age, 30 Church St., New York 7, N.Y.

BRIDGE CONSTRUCTION

Tenders are invited by the Sault Ste. Marie Bridge Company for the construction of a 370 foot railroad lift bridge over the South Ship Canal at Sault Ste. Marie, Michigan. Tenders must be delivered to the office of the Chief Engineer of the Soo Line Railroad, Minneapolis, Minnesota not later than 10 A.M., May 9th.

Plans and specifications are on file for inspection at the Soo Line Office in Minneapolis and the Corps of Engineers Offices in Detroit and Sault Ste. Marie. Copies of plans and specifications will be furnished at a fee of $23.00.

APPRENTICE TRAINING

Since 1909, The Railway Educational Bureau has trained men for a number of our major railroads. We furnish the texts, questions and grading service for all technical instruction covering 3- or 4-year programs. These are raising the skill and efficiency of 3000 apprentices today. The Bureau is staffed and its texts authored by railroad men. Information is available describing methods used and fields covered.

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Consulting Engineering Firm with International Practice requires experienced Railroad Engineer to conduct location work for new railroad in French Equatorial Africa, including supervision survey and boring crews. Minimum 10 years experience in Railroad Location. Minimum employment one year—possibly extended to three years. Family may accompany. Salary high. Knowledge of French desirable. Address Box 825, RAILWAY AGE, 30 Church St., New York 7, N.Y.

What Market Research Can Do

THIS RELATES TO:

1—Challenging competition
2—Holding to high service standards
3—Increasing internal strength
● 4—Getting a higher level of earnings
5—Improving tools and methods
6—Seeking a friendlier environment

Railroads have always done some "market research"—the systematic search for ways to increase profitable traffic. But a *new approach* to the study of traffic opportunities is needed today—because the market place wherein the railroads must seek increased traffic now is not at all the kind of place it was in the twenties and before. In those days, increased traffic (except that diverted from other railroads) came from the gradual growth of production along most railway routes. As producers prospered, so did the railroads—almost automatically.

Today, something else besides a prospering territory is needed to assure growth in railroad prosperity—and that something is the adaptation of railroad service and charges to the fact that few shippers today *have* to use the railroads. The railroads cannot expect to make the changes in service and charges which will be most to their advantage, unless they have comprehensive and systematic information on total traffic (not just the rail part) in each important commodity, with distances moved. Also needed is exact information on how charges for rail movement compare with costs to the shipper of moving his goods in some other way.

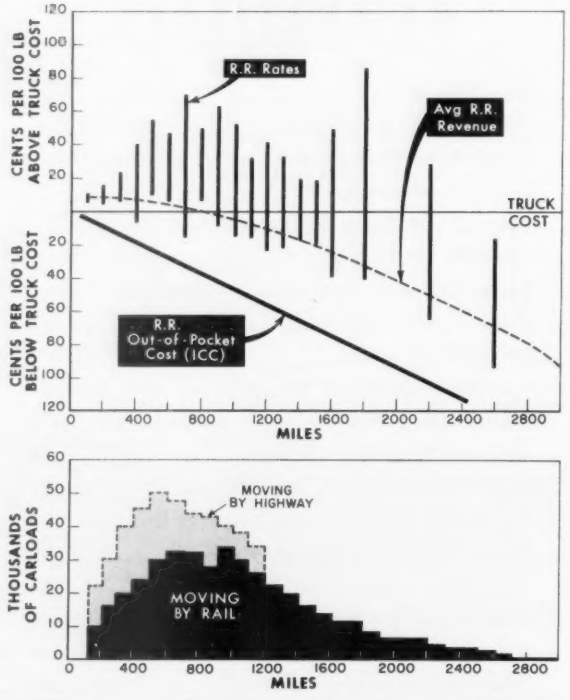
The kind of useful information that collective market research can provide about each important commodity is illustrated in the accompanying chart. *This chart does not represent the traffic volume and rates for any actual commodity*, but is merely meant to show some of the kinds of information that competent researchers are capable of making available.

Each of the vertical lines toward the top of the chart represents the range of railroad charges for hauls of equal distance. The dotted line shows the average of railroad charges. Such information is obtainable from waybill samples. The carloads for each corresponding distance are shown at the bottom of the chart. Above the carloads, in dotted outline, are shown the carloads moving by truck or other means of transportation. This information is obtainable by sampling techniques—and in part from census data.

The cost of truck (or waterway) movement—shown as the O line in the upper chart—can be provided by people experienced in these other types of transportation. With rate and traffic data charted in some such manner as this, it is easy for rate people to discern where rates may be raised with little risk—and also where downward adjustments should yield increased net revenue.

Some people identify "market research" with railroad "cost finding." Microscopic study of railroad costs cannot be done on a collective basis, because actual railroad costs vary from road to road. The determination of railroad costs down to a hair is not needed now for market research purposes, and probably won't be for a long time to come. ICC cost data, supplemented by that made available by individual railroads, should suffice.

Market information of this kind shown in the chart—with a great deal of supplemental data, if needed—can be set up by competent analysts in almost any form of chart or table, likely to be most informative to practical rate men. Making railroad rates will continue to be the job of practical rate people, and not a function of analysts. But the rate people can make profitable use of the kind of systematic information on available traffic and comparative costs that capable analysts are quite able to provide.



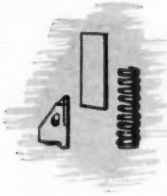
SAVINGS FACTS:

FACT No. 1

Barber Stabilized Trucks save maintenance costs. When it's necessary to service *Barber* parts, the friction castings and side springs are removed and replaced *5 to 10 times faster* than those of any competitive truck.

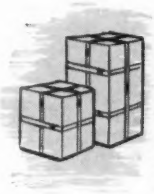
FACT No. 2

Barber Stabilized Trucks protect your equipment. Their unique system of suspension absorbs and eases . . . by friction . . . the destructive vertical shocks and bouncing as well as the lateral forces which usually result in dangerous nosing and swivelling.



FACT No. 3

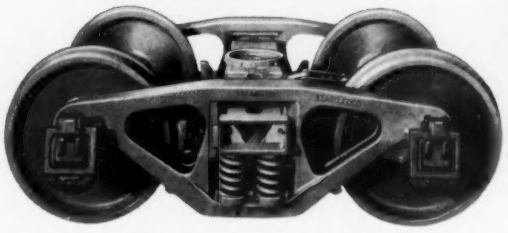
Simplicity and durability in action! Barber's three sturdy parts . . . the special *friction shoe*, the *wear plate* and the *side spring* . . . can be inspected at a quick glance. Fewest possible working parts require less attention, do a better job.



FACT No. 4

Barber Stabilized Trucks save on damage claims. They provide *the* smoother ride for ladings. Simply stated, Barber Stabilized Trucks provide variable friction for variable loads. No over-solid spring blows! For smoother-riding freight cars, insist on Barber.

Specify Smoother-Riding



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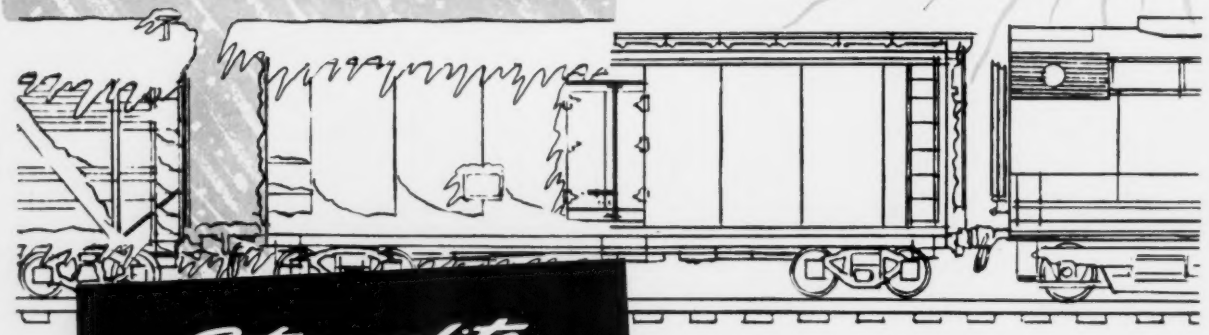
WEATHER OR NOT...



Streamlite HAIRINSUL

protects perishables under all conditions

SIX MAJOR REASONS WHY LEADING REFRIGERATOR CAR LINES SPECIFY *Streamlite HAIRINSUL*

1. **LOW CONDUCTIVITY.** Thoroughly washed and sterilized, all-hair heat barrier. Rated conductivity—.25 btu per square foot, per hour, per degree F., per inch thick.
2. **LIGHT WEIGHT.** Advanced processing methods reduce weight of Streamlite Hairinsul by 40%.
3. **PERMANENT.** Does not disintegrate when wet, resists absorption. Will not shake down, is fire-resistant and odorless.
4. **EASY TO INSTALL.** Blankets may be applied to car wall in one piece, from sill to plate and from one side door to the other. Self-supporting in wall sections between fasteners.
5. **COMPLETE RANGE.** Streamlite Hairinsul is available ½" to 4" thick, up to 127" wide. Stitched on 5" or 10" centers between two layers of reinforced asphalt laminated paper. Other specified coverings are available.
6. **HIGH SALVAGE VALUE.** The all-hair content does not deteriorate with age; therefore has high salvage value. No other type of insulation offers a comparable saving.

Car building engineers have long recognized that Streamlite HAIRINSUL is the most efficient insulation under all operating conditions. A half century of successful use is proof enough that service conditions never retard its high insulating efficiency.

Not only is Streamlite HAIRINSUL a one-time investment; it actually outlives the life of the car and can be salvaged in perfect condition for use in new cars.

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